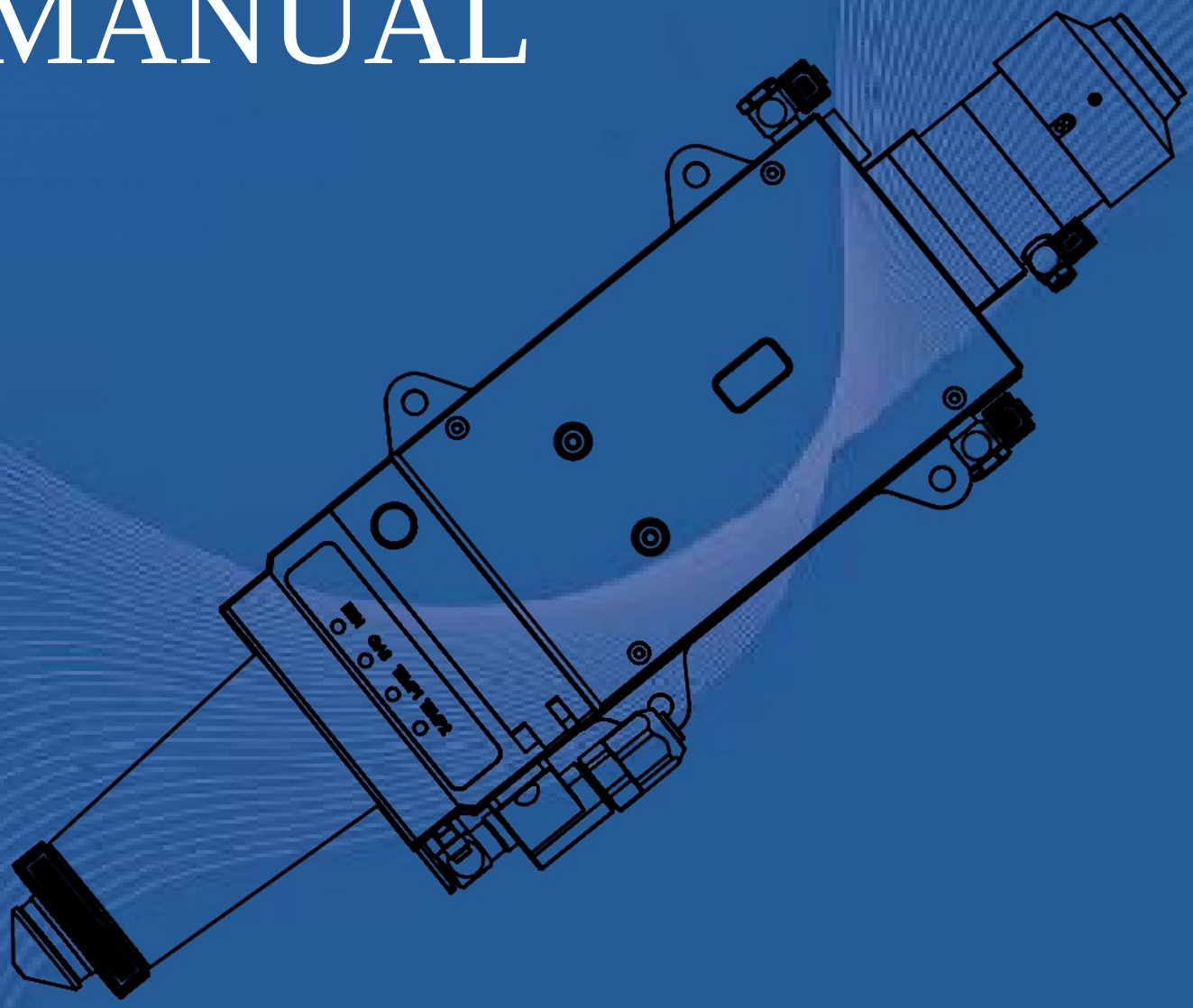
Consultation Hotline:
400-836-8816

PRODUCT INSTRUCTION MANUAL



NC65

Fiber Automatic Focusing Cutting Head (External Drive)

V1.0

Shenzhen Worthing Technology Co., Ltd.
www.wsxlaser.com

Instruction Manual Change Log

Serial Number	Modification Time	Version

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1.1 Product Views

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6. Center Adjustment Window
7.Center Adjustment Window
8. Ceramic Ring
9. Nozzle
10. Locking Ring
11.Collimating Protective Lens Drawer
12. Collimating Lens Drawer
13.Focusing Protective Lens Drawer
14. Lower Protective Lens Drawer
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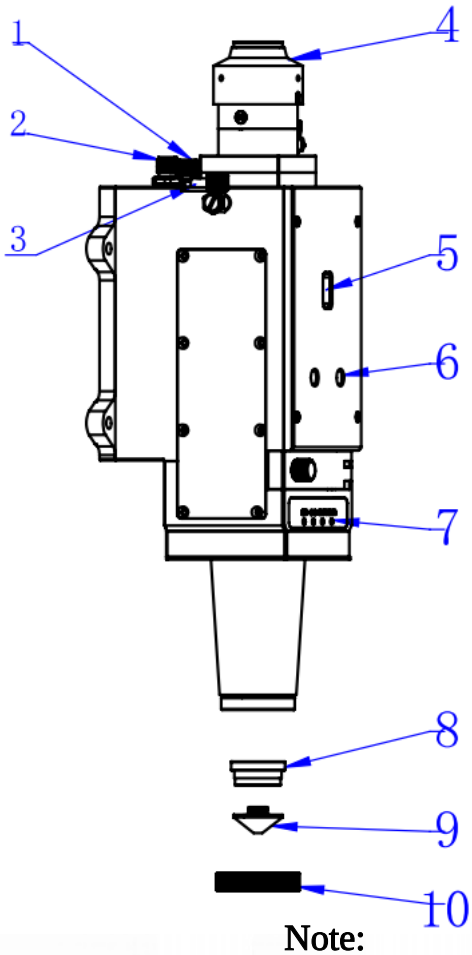
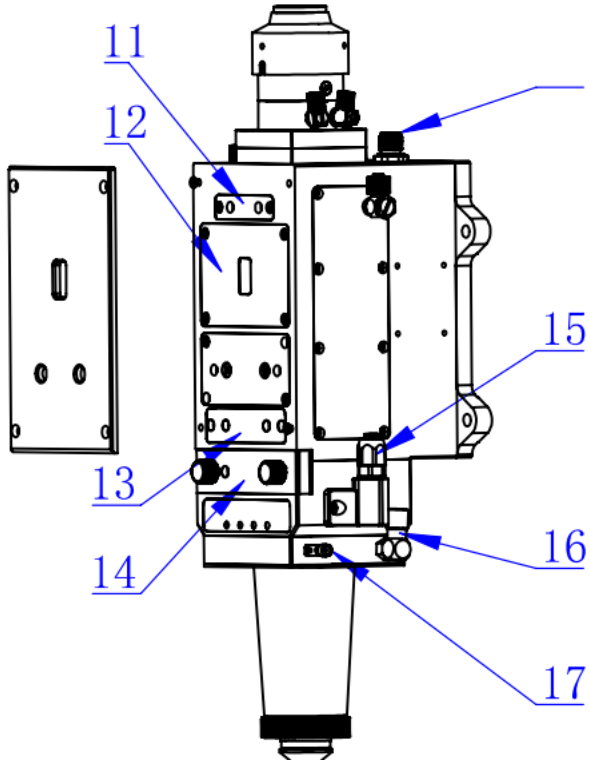




Note:

To avoid damage during storage and transportation, the following conditions must be noted:

1.The cutting head should be stored within the allowable temperature and humidity range.

2.The staff should take reasonable measures to prevent the cutting head from being vibrated or impacted;

3.The cutting head should not be stored in or near a magnetic field (such as a permanent magnet or a strong alternating field).

1.2 Technical Parameters

Basic Parameters	
Cutting Head Model	NC65
Applicable Power	≤8kw
Laser Wavelength	1070±30nm
Fiber Interface Type	QBH/G5/QD, etc.
Collimating Protective Lens	D25.4x4
Collimating Focal Length	D37x100mm
Focusing Focal Length	D37xF150mm/D37x200mm
Focus Adjustment Range	±21(100:150)/±38mm(100:200)
Middle Protective Lens	D34x5
Lower Protective Lens	D34x5
Centering Adjustment Range	±1.5mm
Cutting Gas Interface	Φ10 (Optional Φ10), Max 2.5MPa
Cooling Gas Interface	Φ6, Max 0.6MPa
Cooling Water Interface	Φ8, Max 0.5MPa
Operating Temperature	3℃~+55℃
Storage Temperature	-20℃~+55℃
Weight	Approximately 5.4kg (QBH Interface)

2. Installation ofthe cutting head

2.1 Preparation work

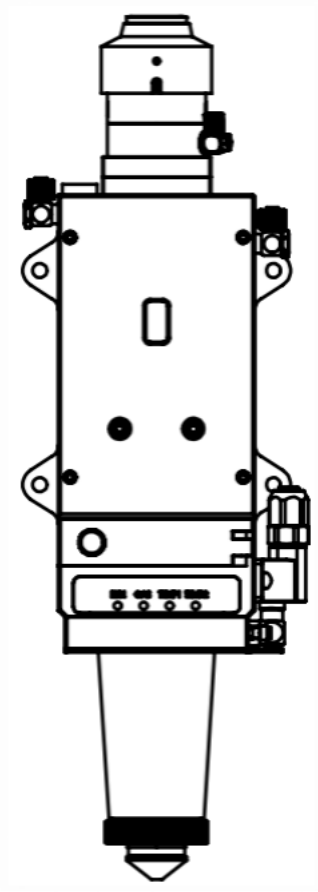
The preparation work aims to prevent dust or dirt from entering the cutting head. You can refer to thefollowing methods for the installation of the cutting head:

Before operation, the following conditions need to be met:

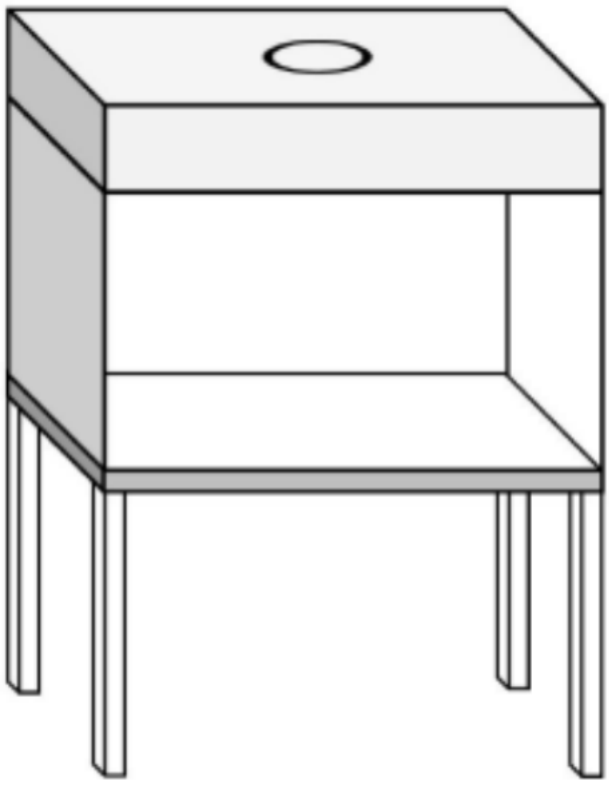
A. Cutting head

B. Clean workbench (Type ofclean workbench: vertical purification;Cleanliness class: ISO5, Class 100; Average wind speed:≥0.4 m/s)

C. Cleaning kit high-intensity flashlight, absolute ethanol (or IPA), dust-free purification cotton swabs, dust-free cloth, compressed air dust removal canister (or air blower).



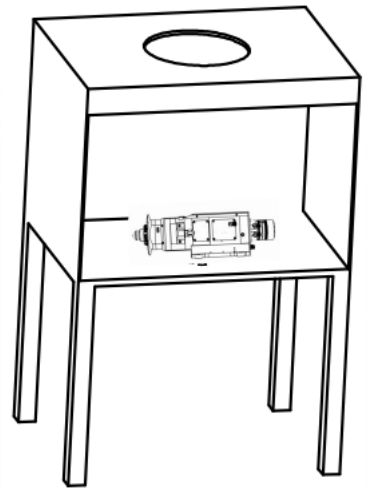
Cutting head



Clean workbench

2.2 Specific operation process

Prepare the clean workbench and start it to work.



The clean workbench should have the following s pecifications:
Type: vertical purification;
Cleanliness class: ISO5, Class 100; Average wind speed ⩾ 0.4 m/s

Preparation:

A. Check that the equipment is clean and qualified (check the cleanliness with a dust particle counter), and ensure that the FFU purification unit is within the validity period (measure the average wind speed in the working area. When the wind speed cannot reach 0.3 m/s, the FFU purification unit must be replaced).
B. Check whether each switch is operating normally and whether the fan is operating normally.
C. Unnecessary items are strictly prohibited from being placed in the clean working area to ensure that the clean airflow is not disturbed.
D. For a newly installed or long - unused clean workbench, clean it with a dust - free cloth and absolute ethanol before use.

Startup and use:

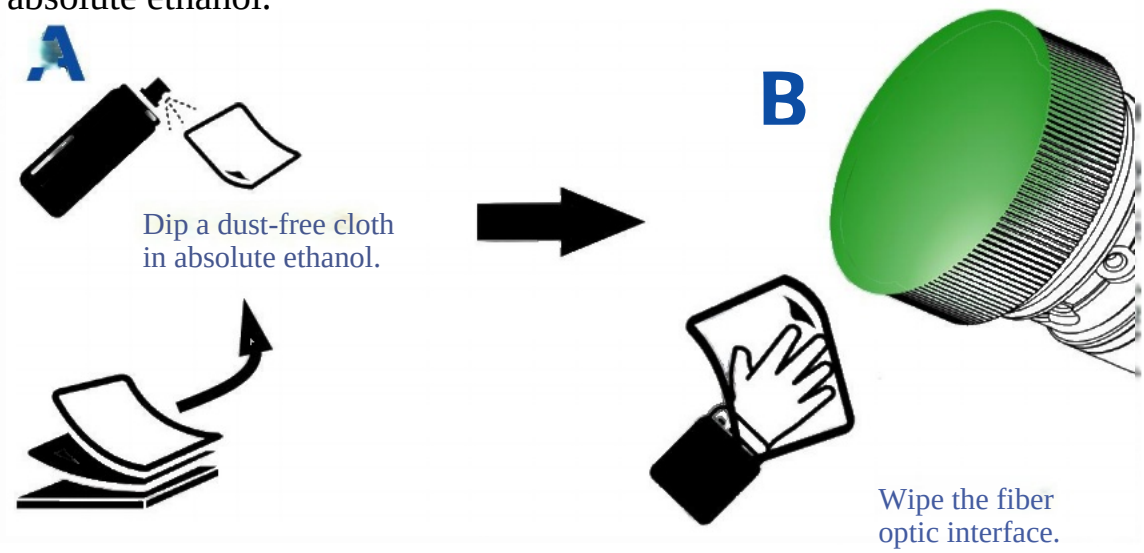
A. Connect the power supply and pull the glass sliding door of the clean workbench to the lowest position (leaving a gap of about 10 cm).
B. Start the fan and it is recommended to pre - purify the clean area for about 20 minutes.
C. After normal operation, turn on the lighting power supply of the clean workbench.

Special instructions:

A. Only trained professionals are allowed to operate.
B. If operators do not follow the safety work specifications, it may pose a danger to personnel or property.
C. To ensure the normal operation of the laser device in the working environment and the safety of operators, relevant operating specification instructions must be followed and implemented.

2.3 Wipe the fiber optic connector of the cutting head

Wipe the fiber optic interface of the cutting head with a dust - free cloth dipped in absolute ethanol.



2.4 Check the end face of the laser fiber

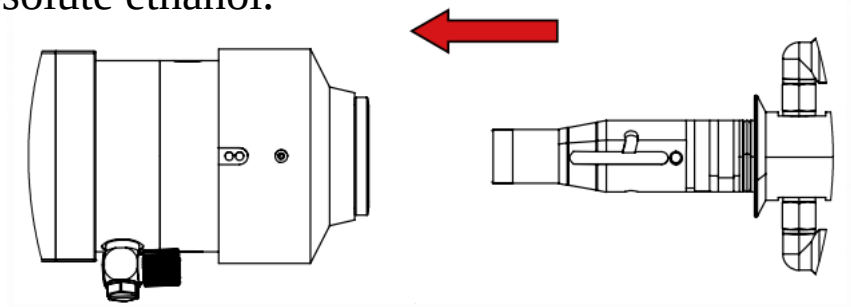
Remove the protective cap of the laser fiber, shine a high - intensity flashlight on the end face of the fiber to check for contamination. If it is clean, the fiber can be directly inserted. If it is dirty, clean it with a cott on swab dipped in absolute ethanol or IPA.

2.5 Remove the protective film/protective cap

Remove the special protective cap/protective plug on the fiber optic interface of the cutting head.

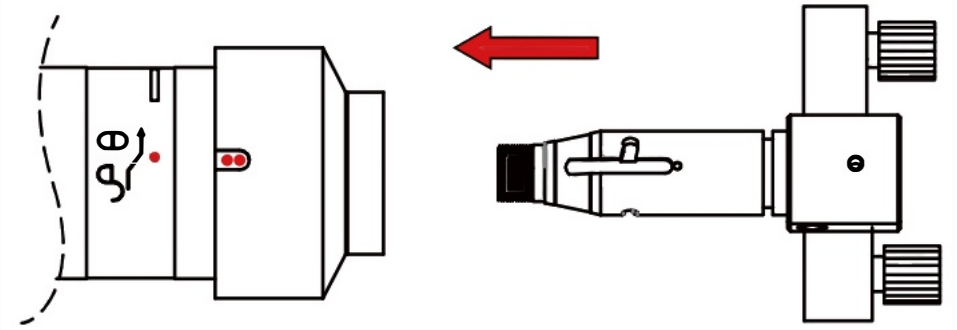
2.6 Connect the fiber optic interface

(1) First, place the fiber rod and the fiber connector in a horizontal state.
(2) Clean the fiber rod and the fiber connector with a dust - free cloth and absolute ethanol.



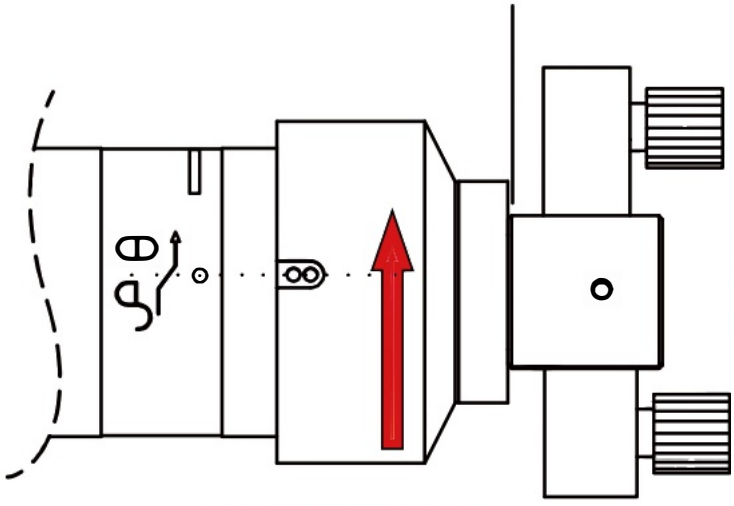
The red dots are on the same straight line.

(3) Gently insert the fiber rod into the fiber connector.



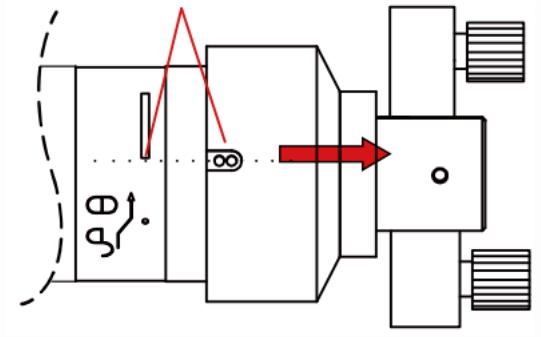
(4) After inserting the fiber rod all the way in, rotate the red mark on the rotating sleeve in the direction of the arrow until it is within the white marking line.

Align them first.



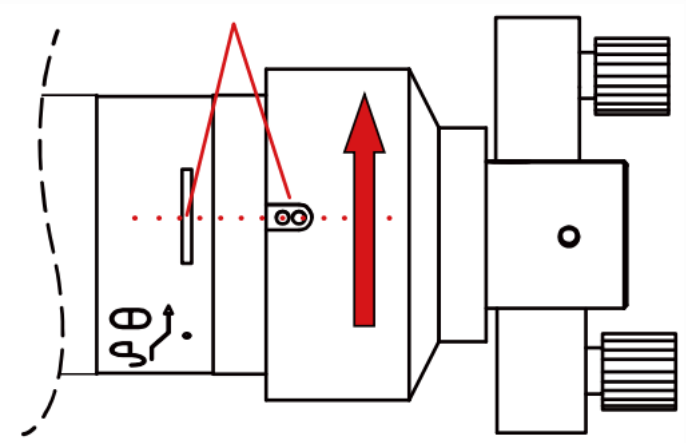
(5) Then pull up the rotating sleeve in the direction shown in the diagram.

First align, then pull up.



(6) Gently rotate it again in the direction shown in the diagram with moderate force . Usually, you can feel it is locked (twist with your thumb and index finger).

It can be aligned or exceed the middle position, but note that you should stop turning once it is in place.

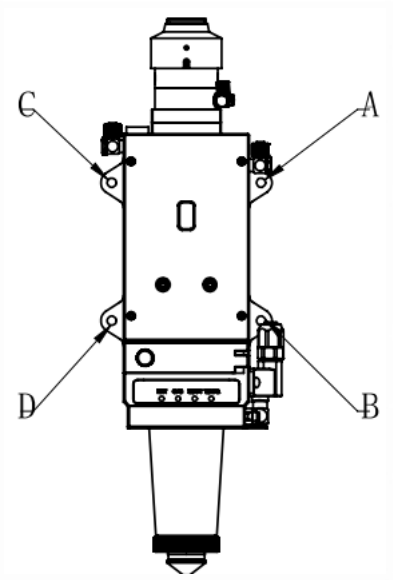


Note! Do not twist it forcefully, as it may damage the precision mechanism!

To prevent dust or dirt from accidentally entering the fiber connector, clean the fiber rod part first! Insert the fiber plug while keeping the laser head in a horizontal state.

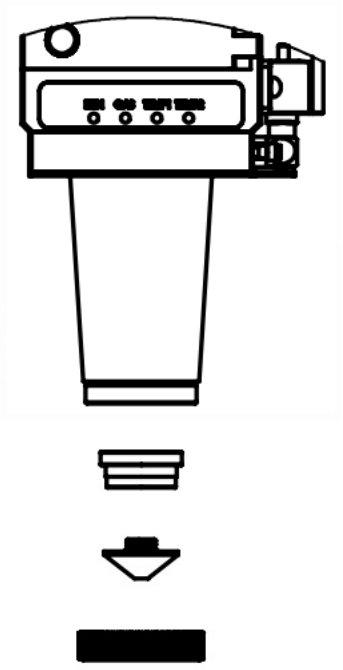
2.7 Install the cutting head on the Z - axis of the cutting machine

Install the cutting head on the back plate of the machine tool ’s Z - axis through four screws A, B, C, and D. When fixing the cutting head to the machine tool, ensure that the cutting head is locked tightly without shaking.



2.8 Install the ceramic ring and nozzle

Install the ceramic ring and lock it firmly, then install the nozzle.

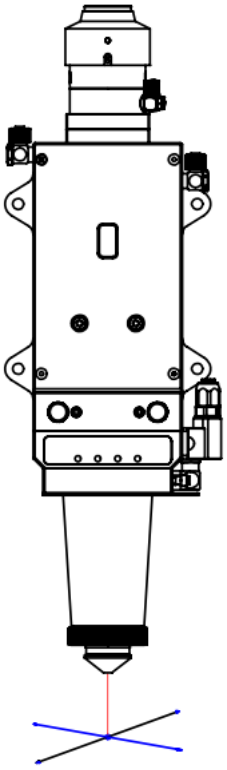


Tighten the nozzle on the ceramic ring by hand, and use a wrench to tighten the ceramic locking ring.

3. Use and Maintenance of the Cutting Head

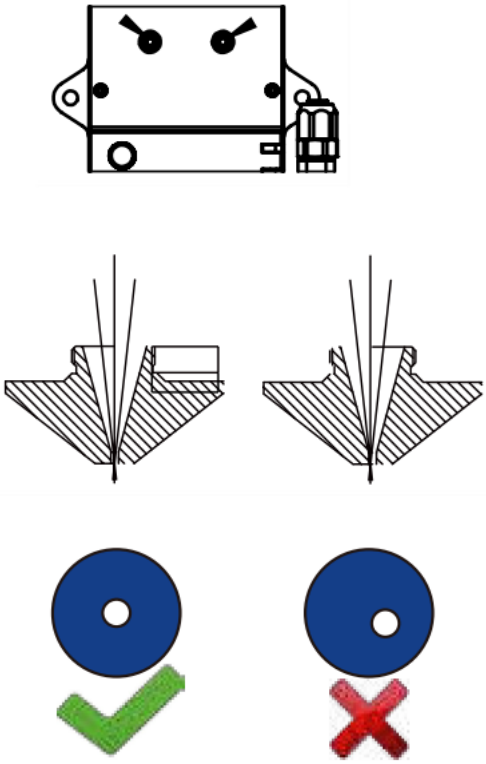
3.1 Coaxial Adjustment

1. Use an Allen wrench to adjust the X/Y horizontal adjustment screws of 1 and 2 so that the laser beam passes through the center of the nozzle.
2. When the laser beam passes through the center of the nozzle, the cutting effect is the best.
3. If the laser beam does not pass through the center of the nozzle, it may result in no light output or poor cutting effect.



X, Y Center Adjustment

X, Y Center Adjustment



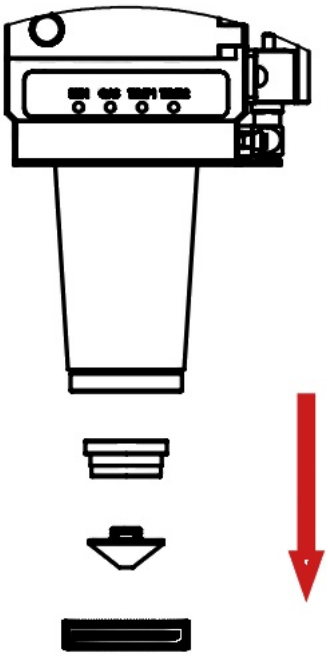
The laser beam passes through the center of the nozzle (Correct)

The laser beam does not pass through the center of the nozzle (Incorrect)

Methods for detecting whether the laser beam passes through the center of the nozzle:

1.Stick transparent tape on the nozzle opening (it is best to use a new or non - deformed nozzle).
2. Adjust the power of the laser to about 50W (for example, for a 500W laser, adjust the pulse power to 10%).
3. Let the laser emit light for 1 - 2 seconds, and then remove the transparent tape.
4. Hold the transparent tape against a light source and observe whether the circular mark of the nozzle on the tape is concentric with the burning point of the laser passing through the tape.
5. If they are concentric, the adjustment result is qualified; if not, continue the adjustment until it is qualified.

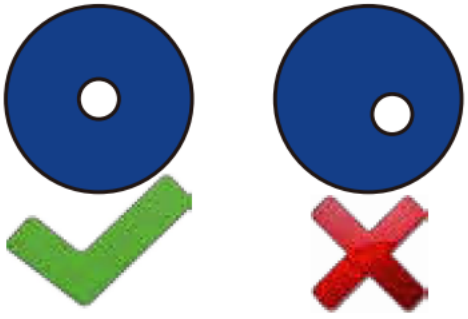
3.2 Replacement of Ceramic Ring and Nozzle



Power Supply

Cooling Gas

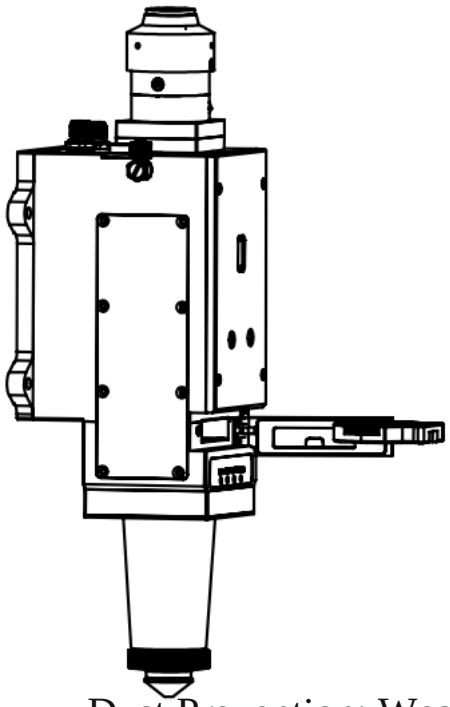
Cutting Gas



Please choose the Wanshunxing brand.

Center Alignment

3.3 Replacement of Lower Protective Lens



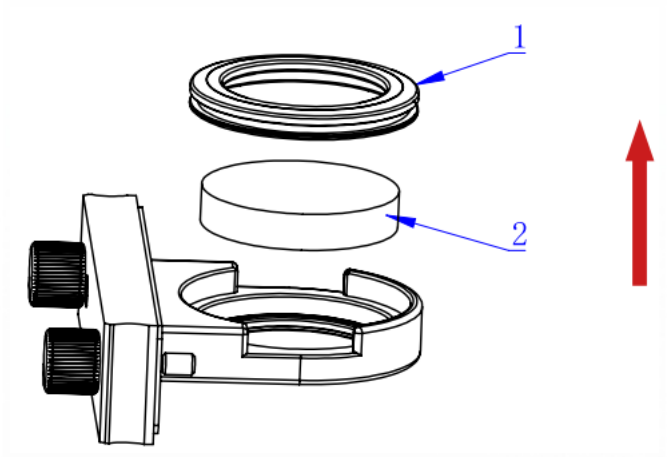
Disassembly Method:
Loosen the locking stud and then take out the drawer.

Power Supply

Cooling Gas

Cutting Gas

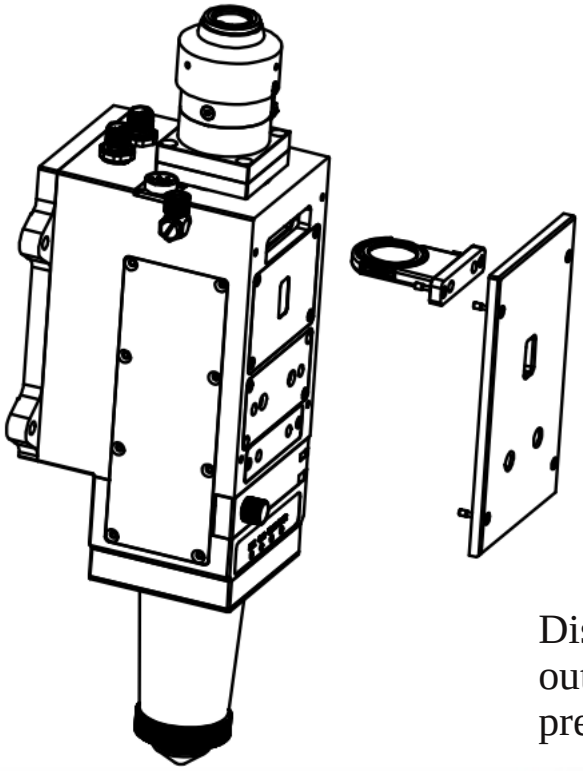
Dust Prevention: Wear dust - proof gloves and finger cots when disassembling and assembling the lens, and the operation should be carried out in a clean place. (When replacing the lens on - site, you can seal the window with masking tape to prevent dust from entering the interior and causing contamination.)



1.Pressure Cover 2.Protective Lens (D37x7)

Disassembly Method: Pull the pressure cover upwards as indicated by the arrow. Do not use tools such as wrenches or pliers, otherwise the parts will be damaged.

3.4 Replacement of Collimating Protective Lens



Caution: Prevent from dropping.

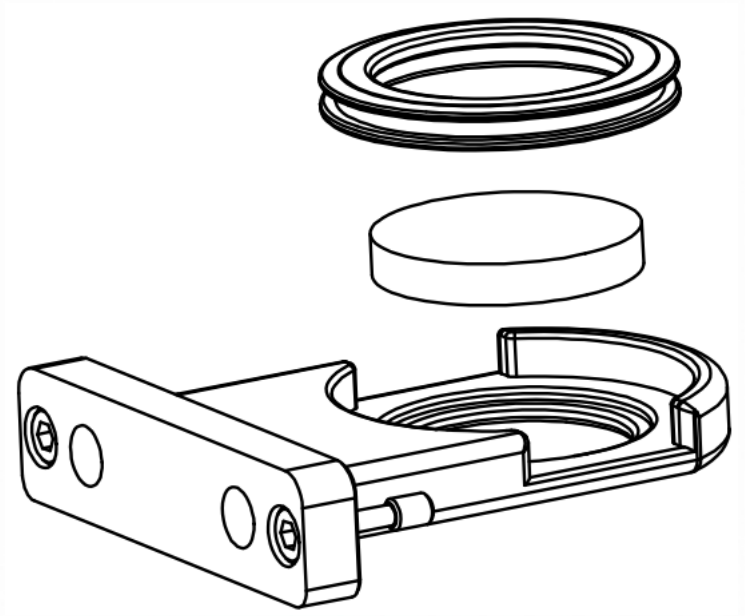
Power Supply

Cooling Gas

Cutting Gas

Disassembly Method: Remove the cover plate, pull out the drawer horizontally, and take out the pressure cover.

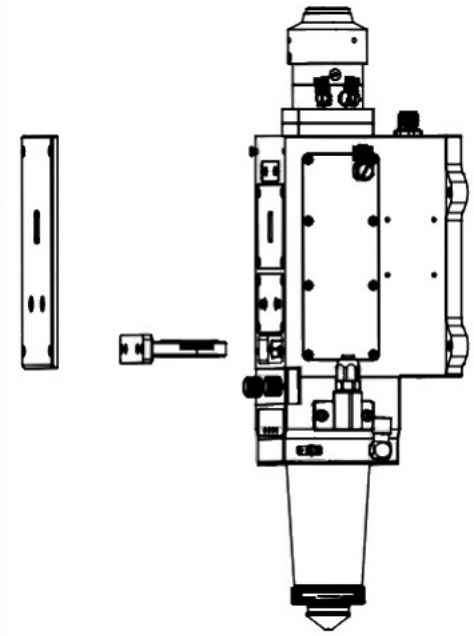
Dust Prevention: Wear dust - proof gloves and finger cots when disassembling and assembling the lens, and the operation should be carried out in a clean place. (When replacing the lens on - site, you can seal the window with masking tape to prevent dust from entering the interior and causing contamination.)



Disassembly Method: Pull out the pressure cover 1 and take out the protective lens 2.

Do not use tools such as wrenches or pliers, otherwise the parts will be damaged.

3.5 Replacement of Middle Protective Lens



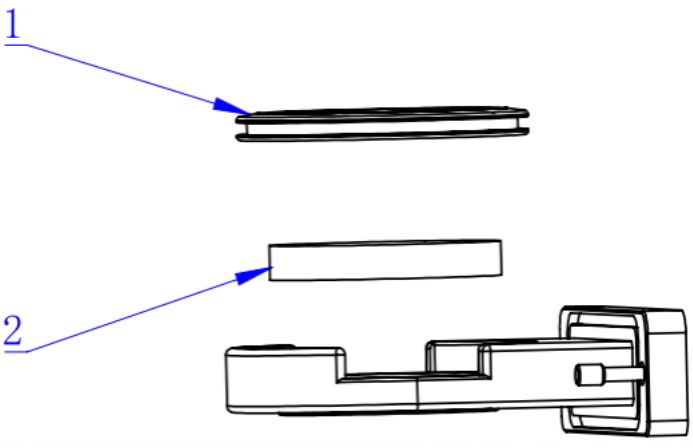
Power Supply

The operation should be carried out on a dust - free workbench.

Cooling Gas

Cutting Gas

Disassembly Method: Remove the cover plate, then loosen the anti - drop screws on the dust cover, and pull out the drawer - type protective lens horizontally.

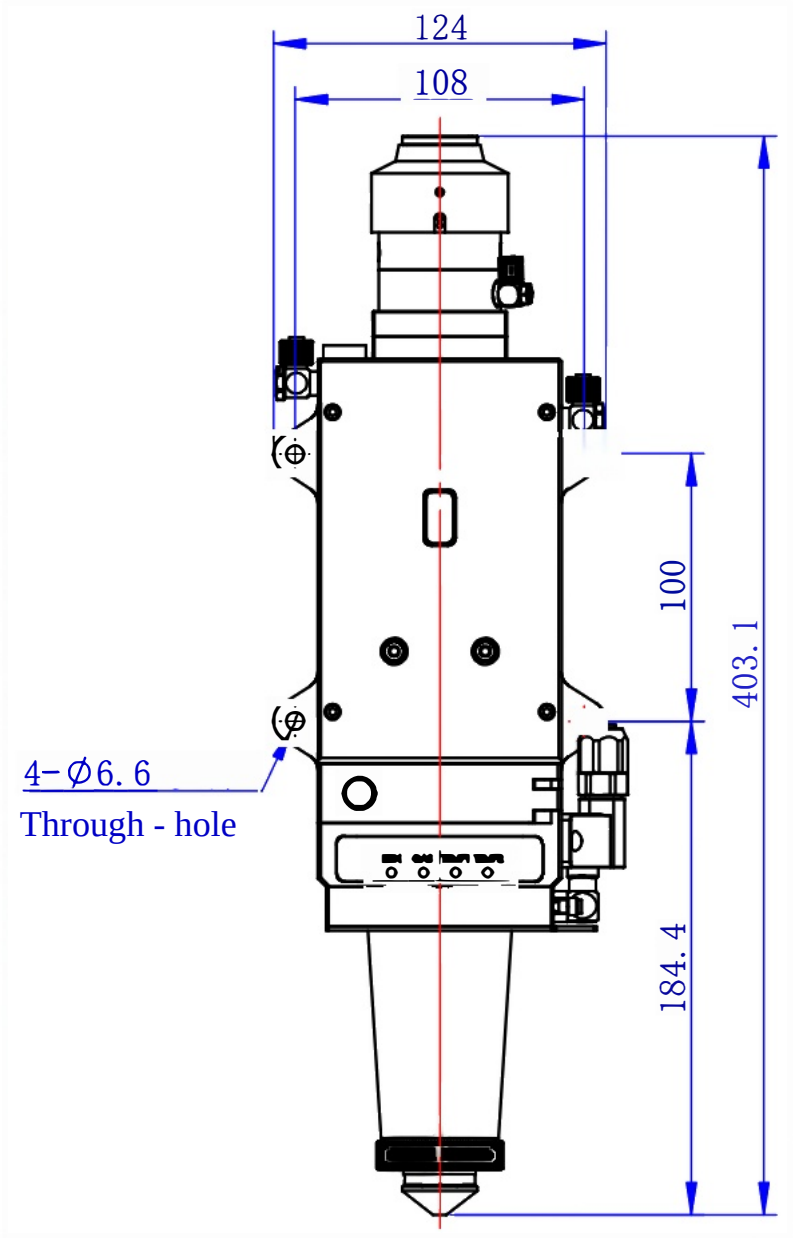


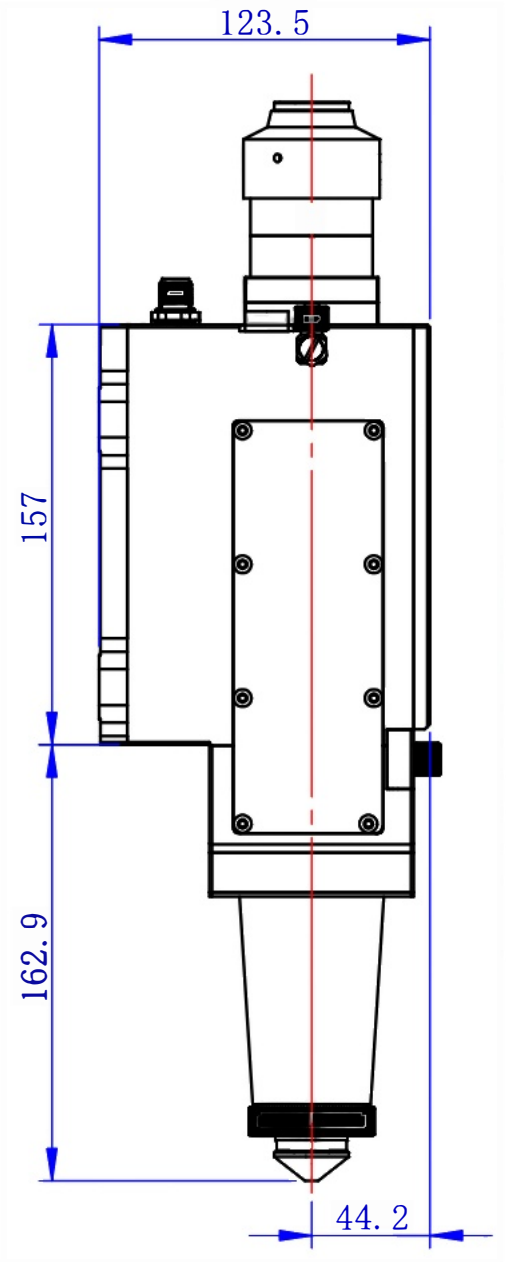
1.Pressure Cover 2. Protective Lens (D34x5)

Disassembly Method: Pull the pressure cover 1 vertically upwards, and then pull the lens upwards as indicated by the arrow. Do not use tools such as wrenches or pliers, otherwise the parts will be damaged.

4.Installation Dimensions of the Cutting Head

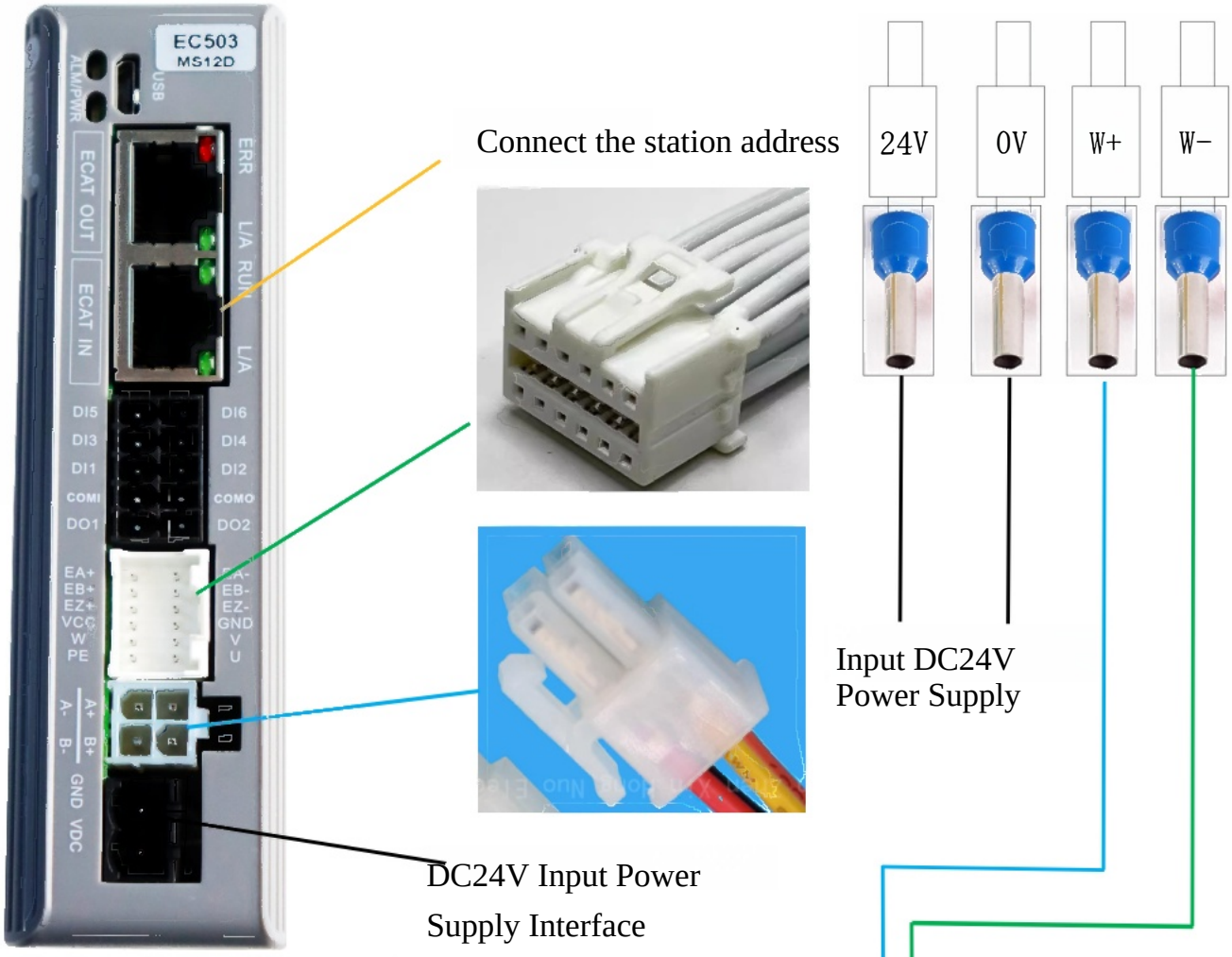
The following dimensions are for the installation of NC65 (F100xF200).



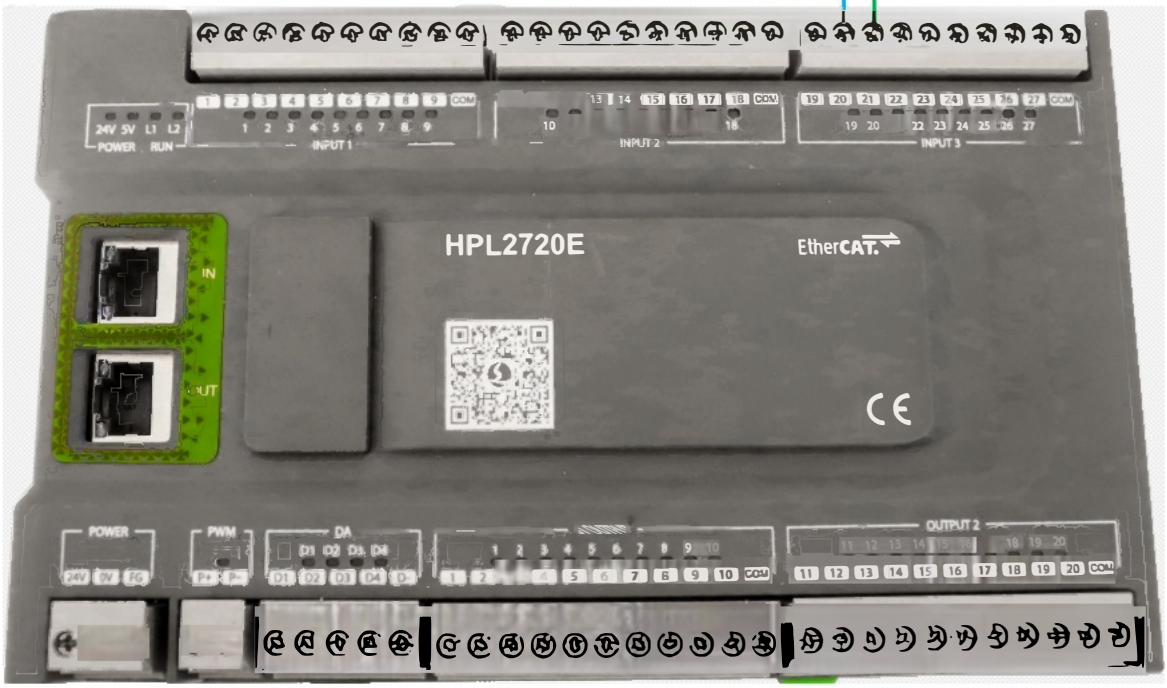


5. Electrical Wiring Instructions

5.1 Wiring Diagram of BCH Bus System

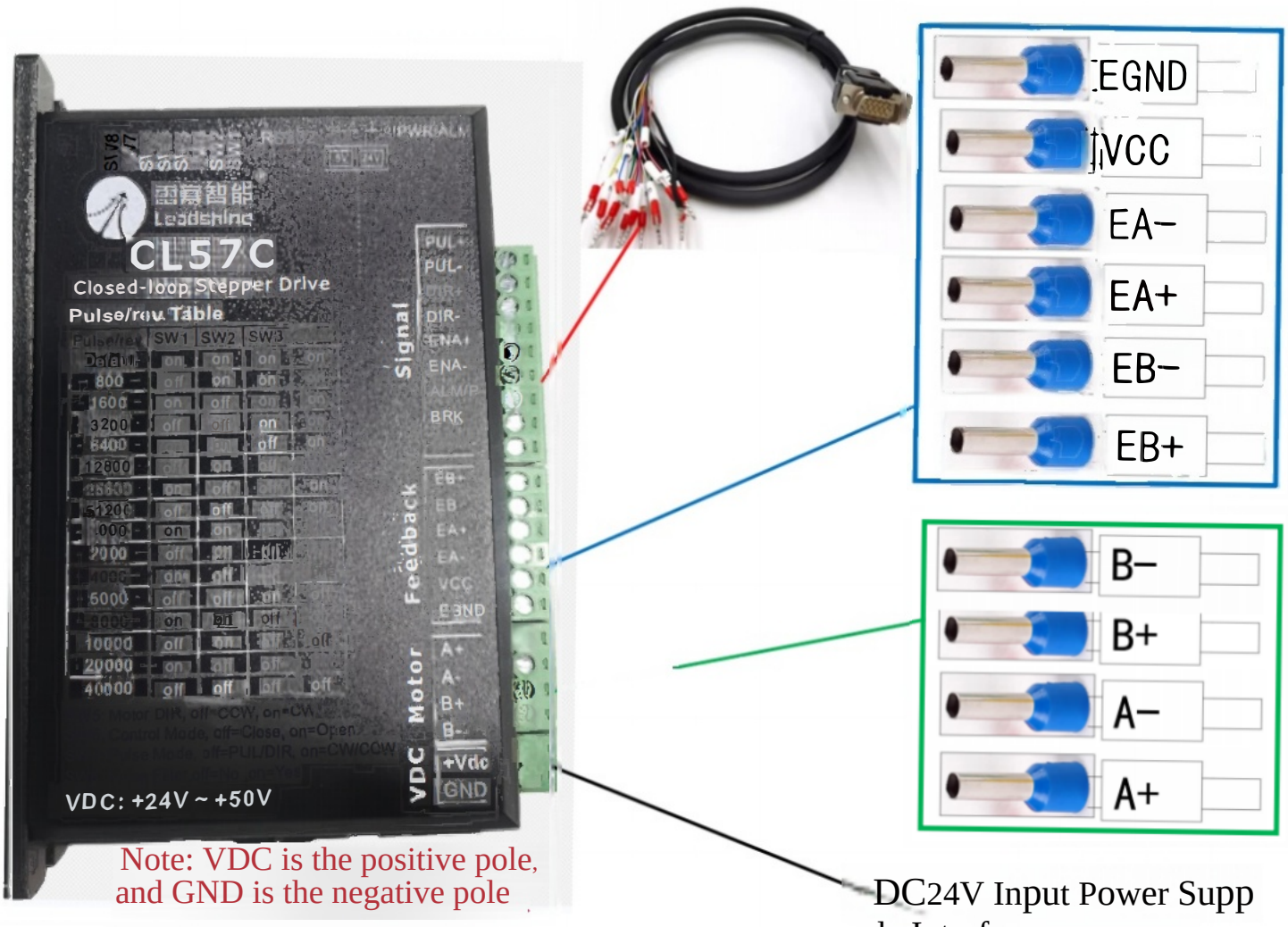


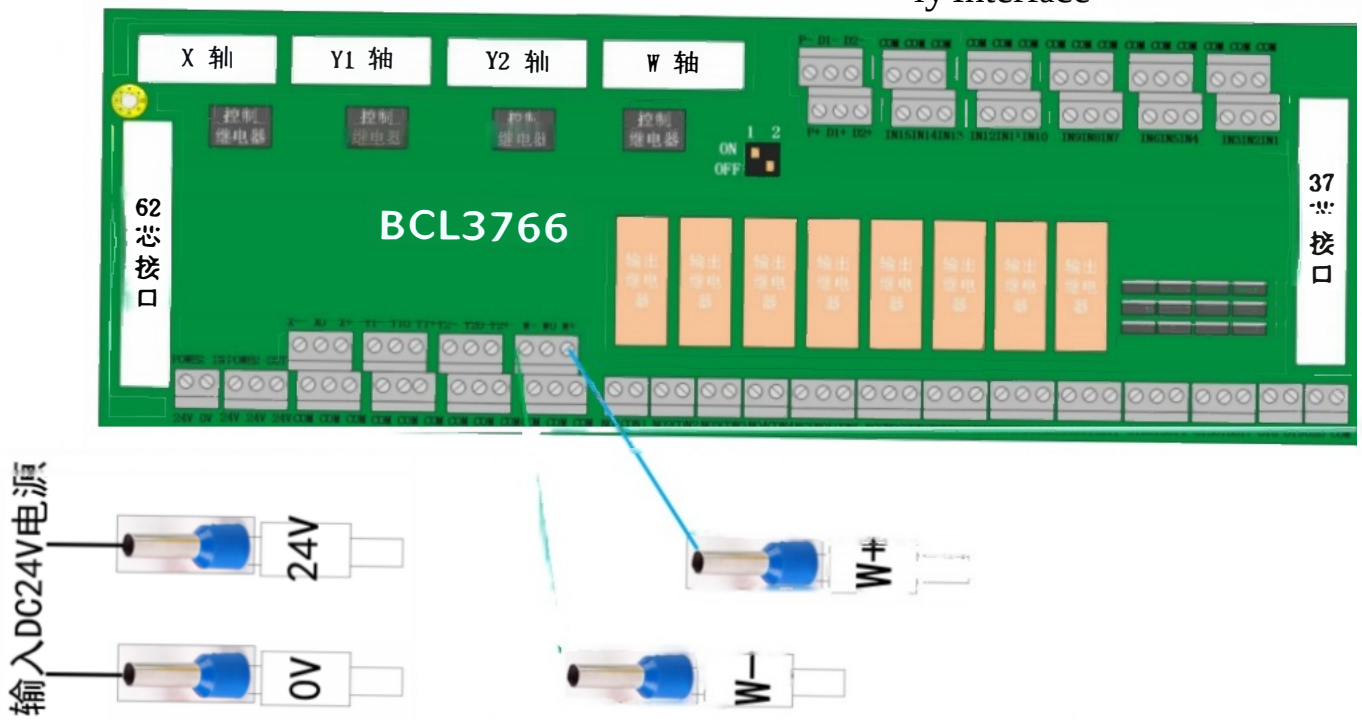
Note: VDC is the positive pole, and GND is the negative pole.



When arranging the electrical cabinet, separate the strong and weak electrical circuits, keep them away from high - power and strongly interfering devices, and ensure good grounding of the equipment.

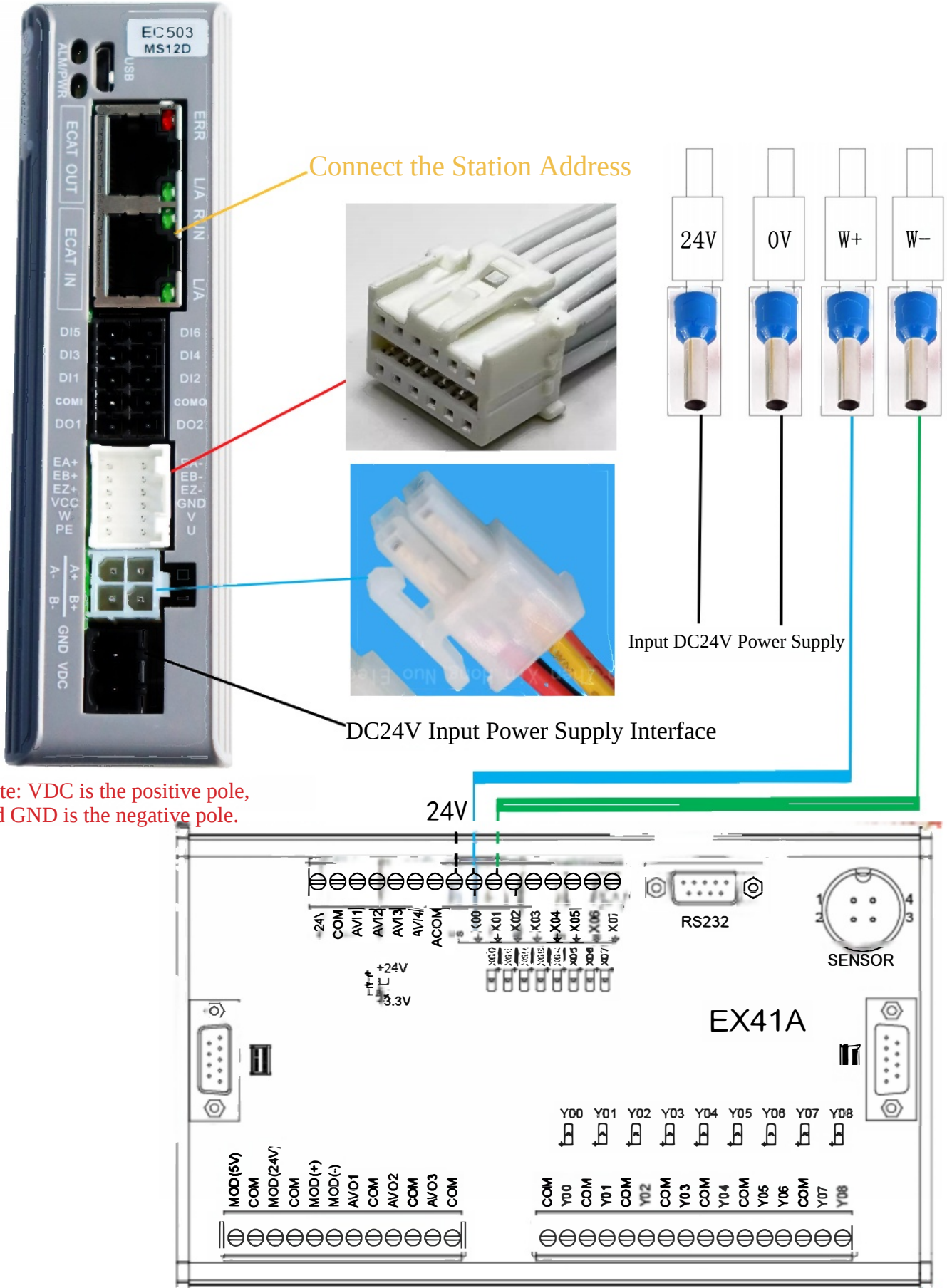
5.2Wiring Diagram of BCH Pulse System





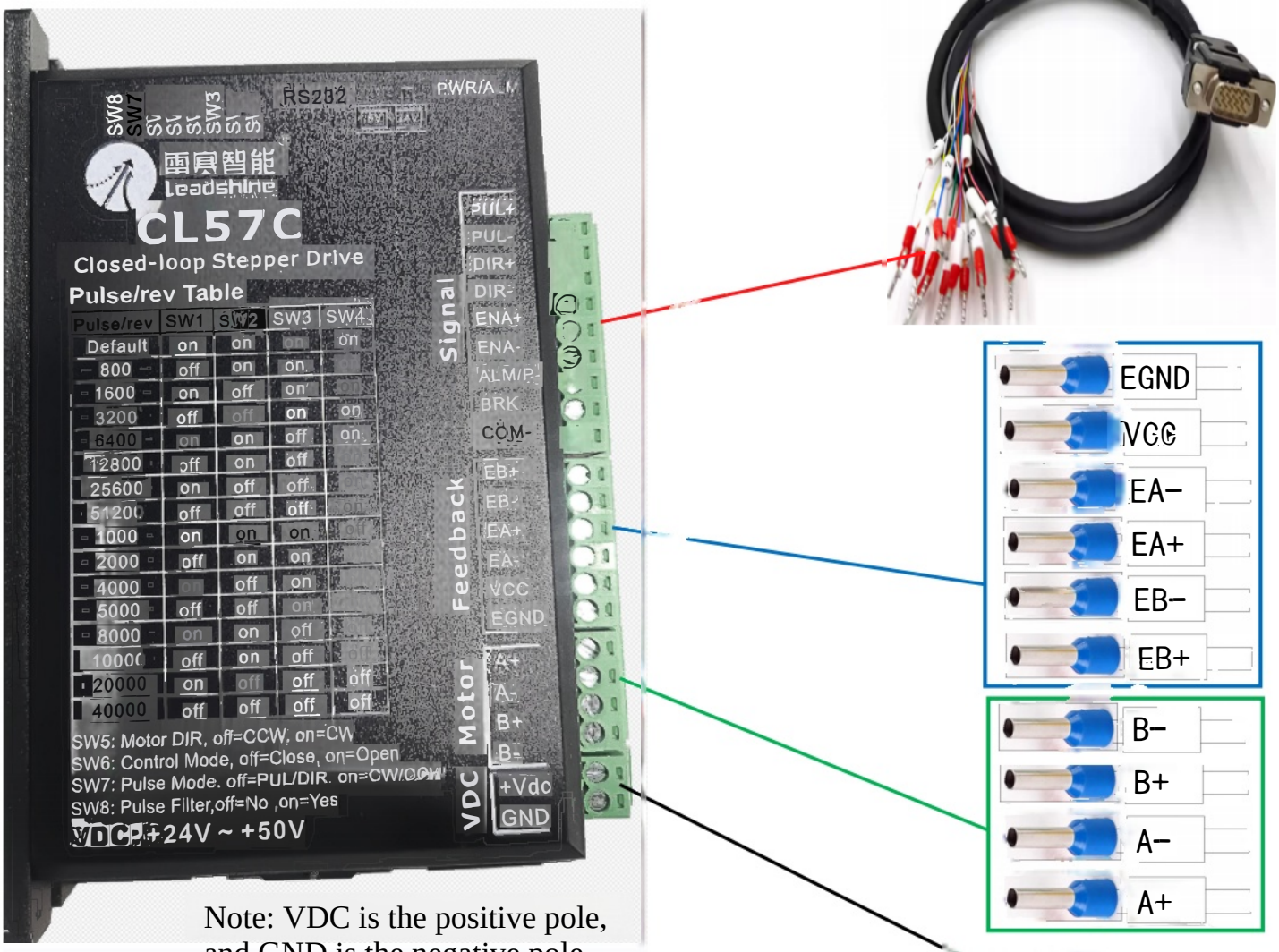
When aranging the electrical cabinet separate the strong and weak electrical circuits, keep them away from high-power and stronglyinterfering devices, and ensure good grounding ofthe equipment.

5.3 Wiring Diagram of WeiHong Bus System



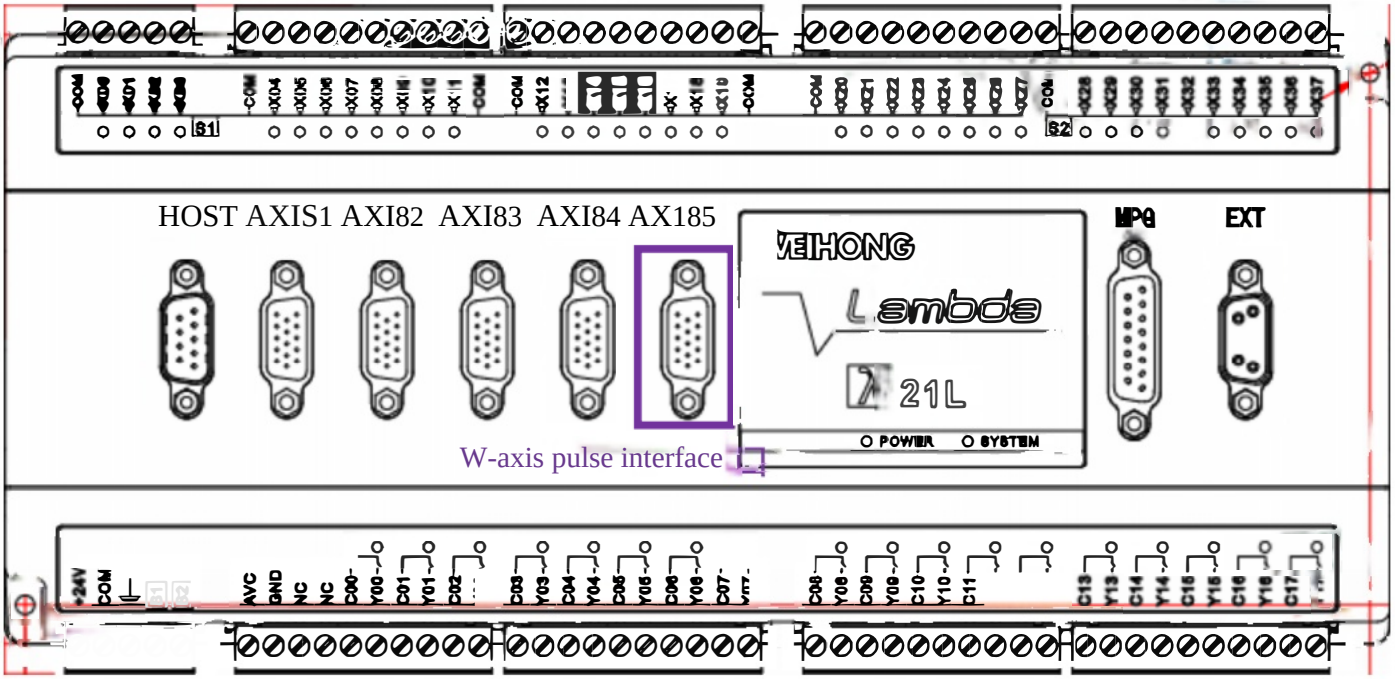
When arranging the electrical cabinet, separate the strong and weak electrical circuits, keep them away from high - power and strongly interfering devices, and ensure good grounding of the equipment.

5.4 Wiring Diagram 1 of WeiHong Pulse System



Note: VDC is the positive pole, and GND is the negative pole.

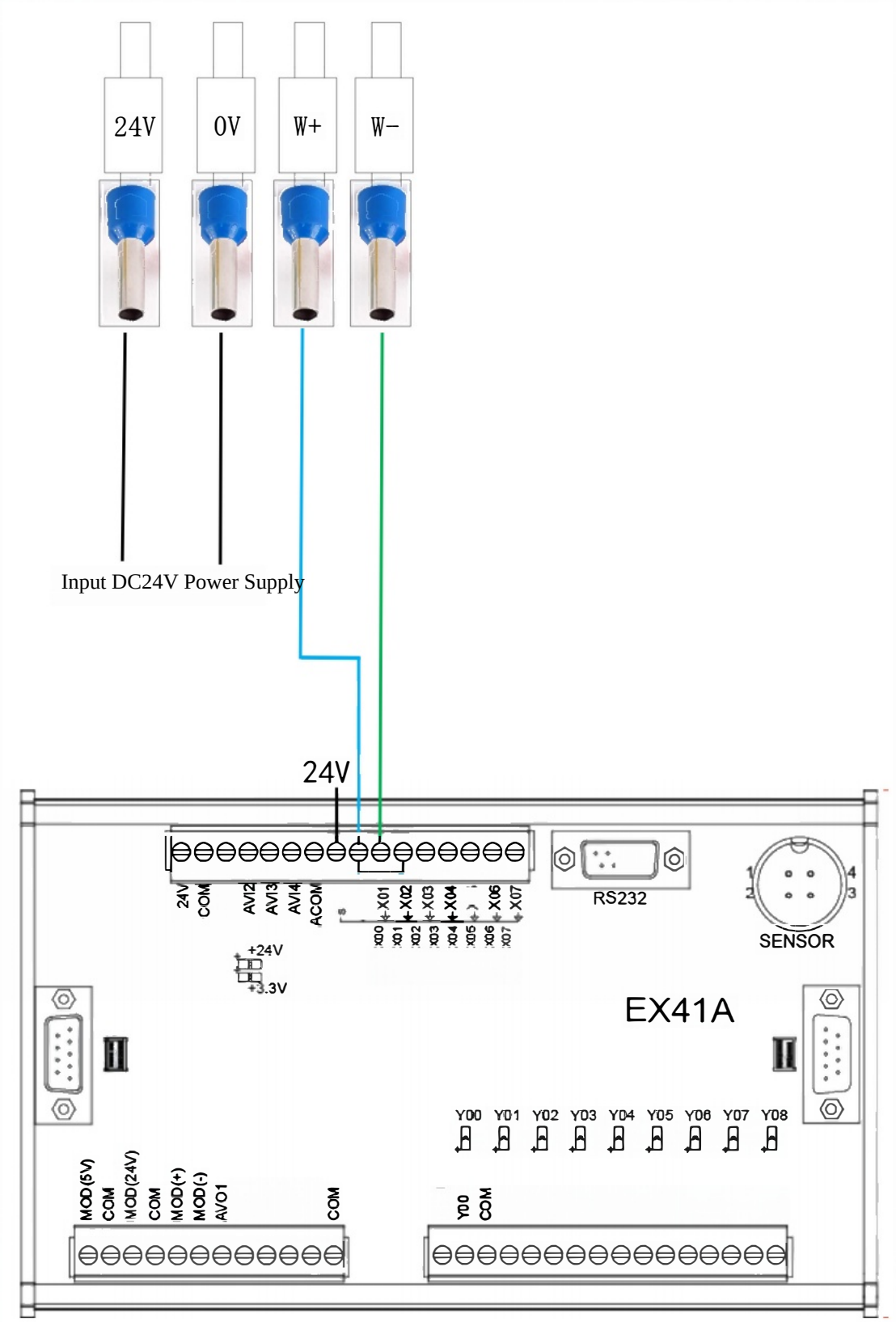
DC24V Input Power Supply Interface



W-axis pulse interface

When arranging the electrical cabinet, separate the strong and weak electrical circuits, keep them away from high - power and strongly interfering devices, and ensure good grounding of the equipment.

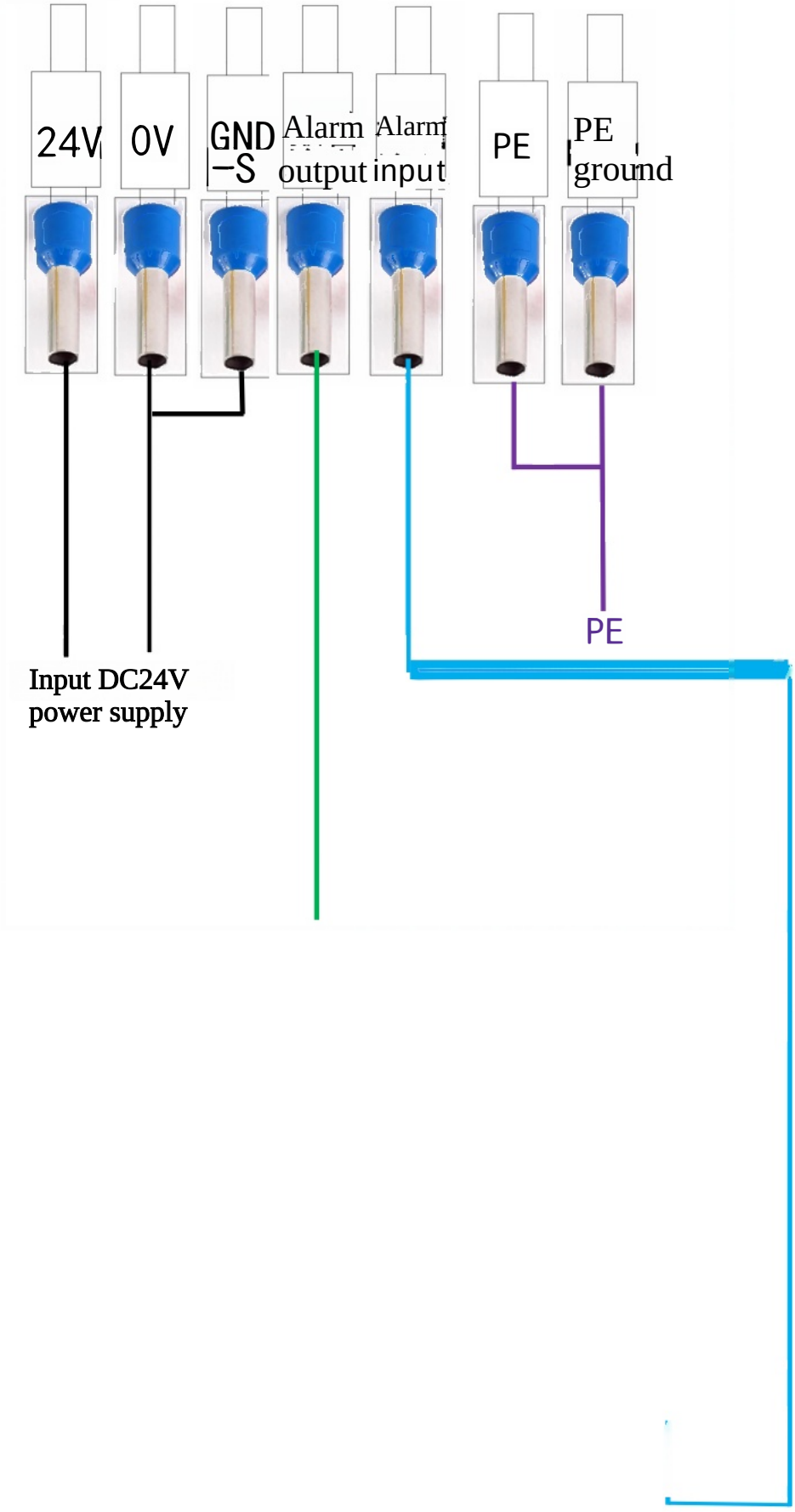
5.5 Wiring Diagram 2 of WeiHong Pulse System



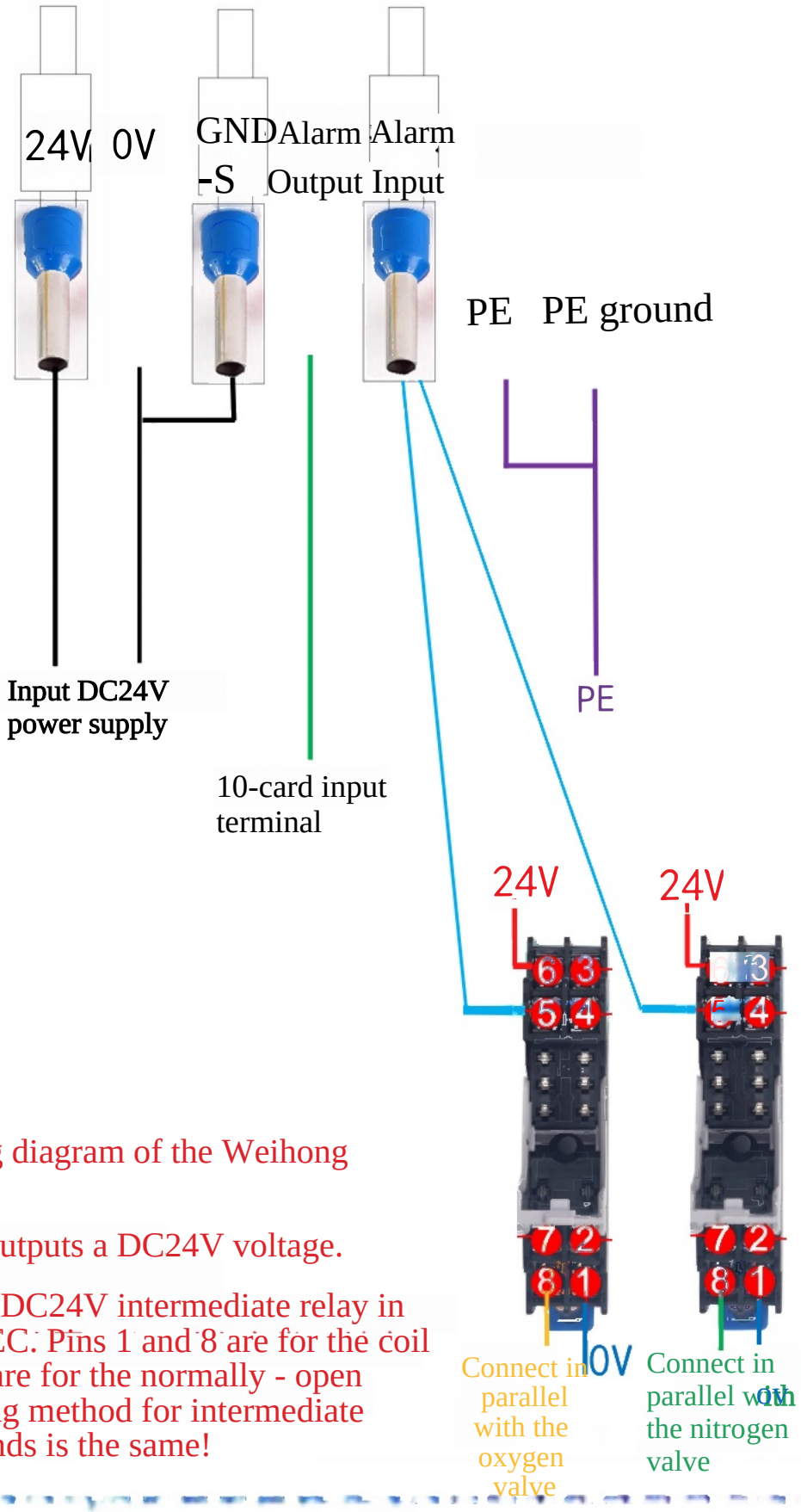
When arranging the electrical cabinet, separate the strong and weak electrical circuits, keep them away from high - power and strongly interfering devices, and ensure good grounding of the equipment.

5.6 Wiring Diagram of Monitoring System with BCH System

Input DC24V Power Supply



Note: The fault alarm outputs a DC24V voltage.



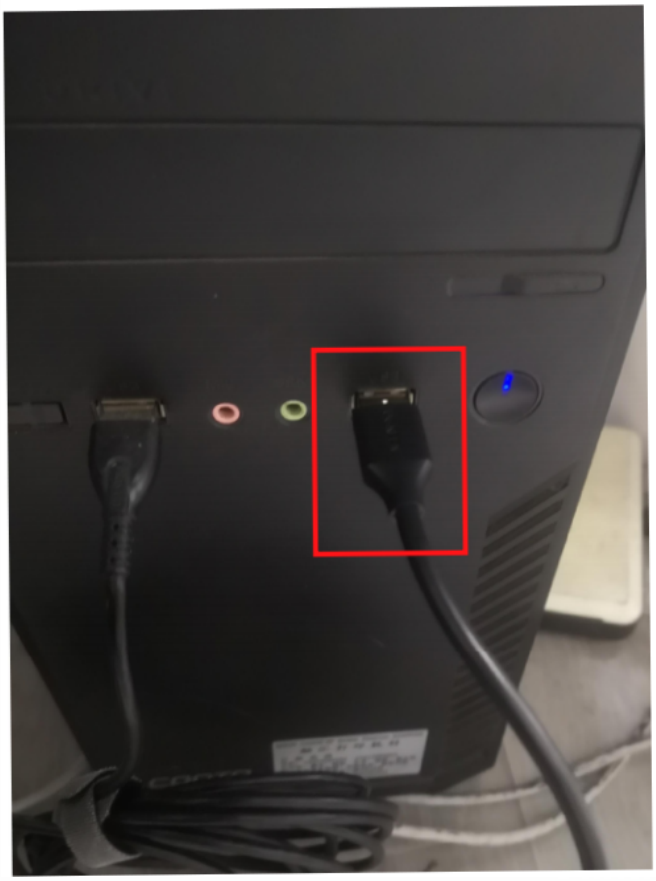
Note:

1.This is the wiring diagram of the Weihong system.

2.The fault alarm outputs a DC24V voltage.

3.The brand of the DC24V intermediate relay in this diagram is IDEC. Pins 1 and 8 are for the coil , and pins 5 and 6 are for the normally - open contacts. The wiring method for intermediate relays of other brands is the same!

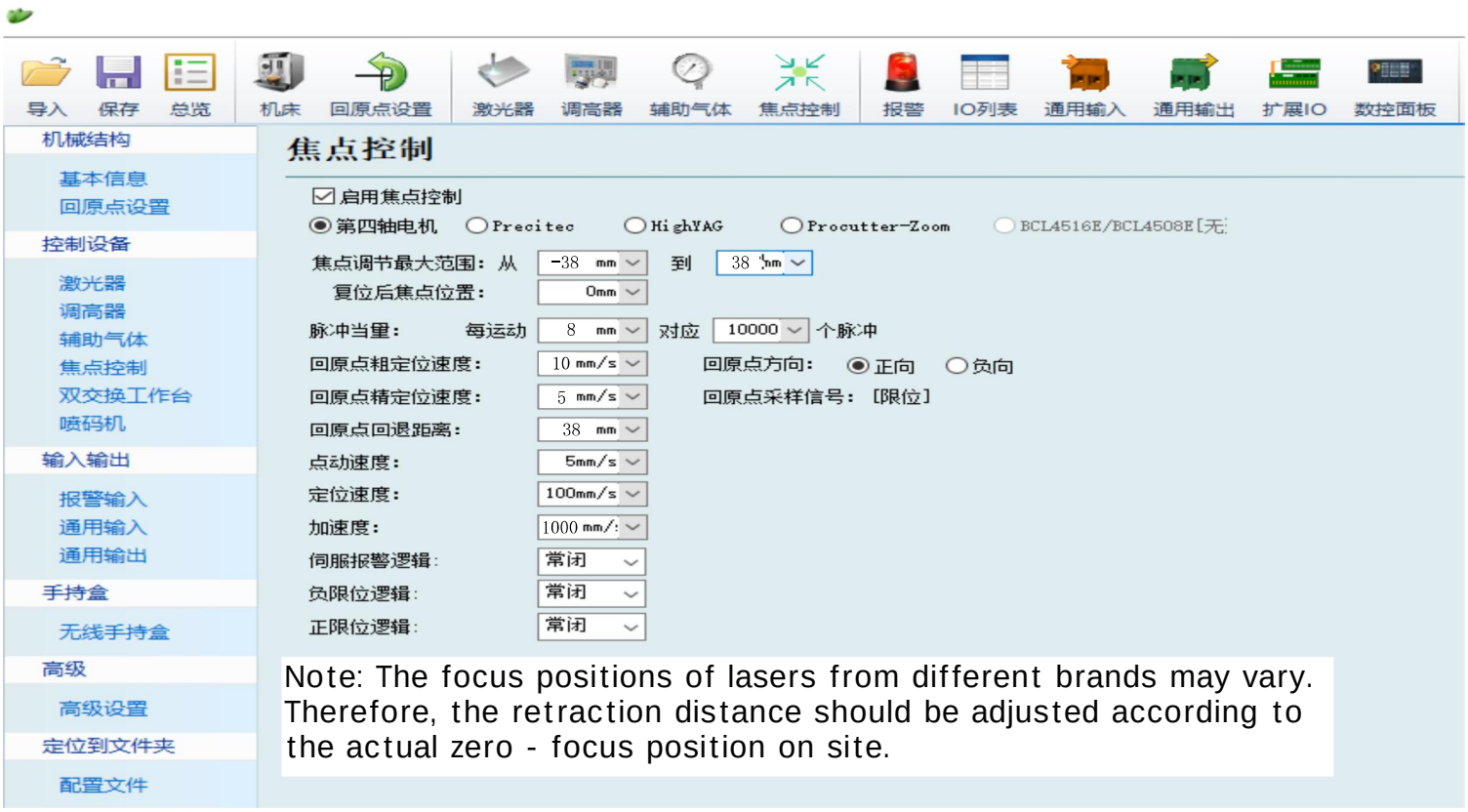
5.8 USB485 Wiring Diagram



Note: If the wiring terminals are not used, they should be removed and kept.

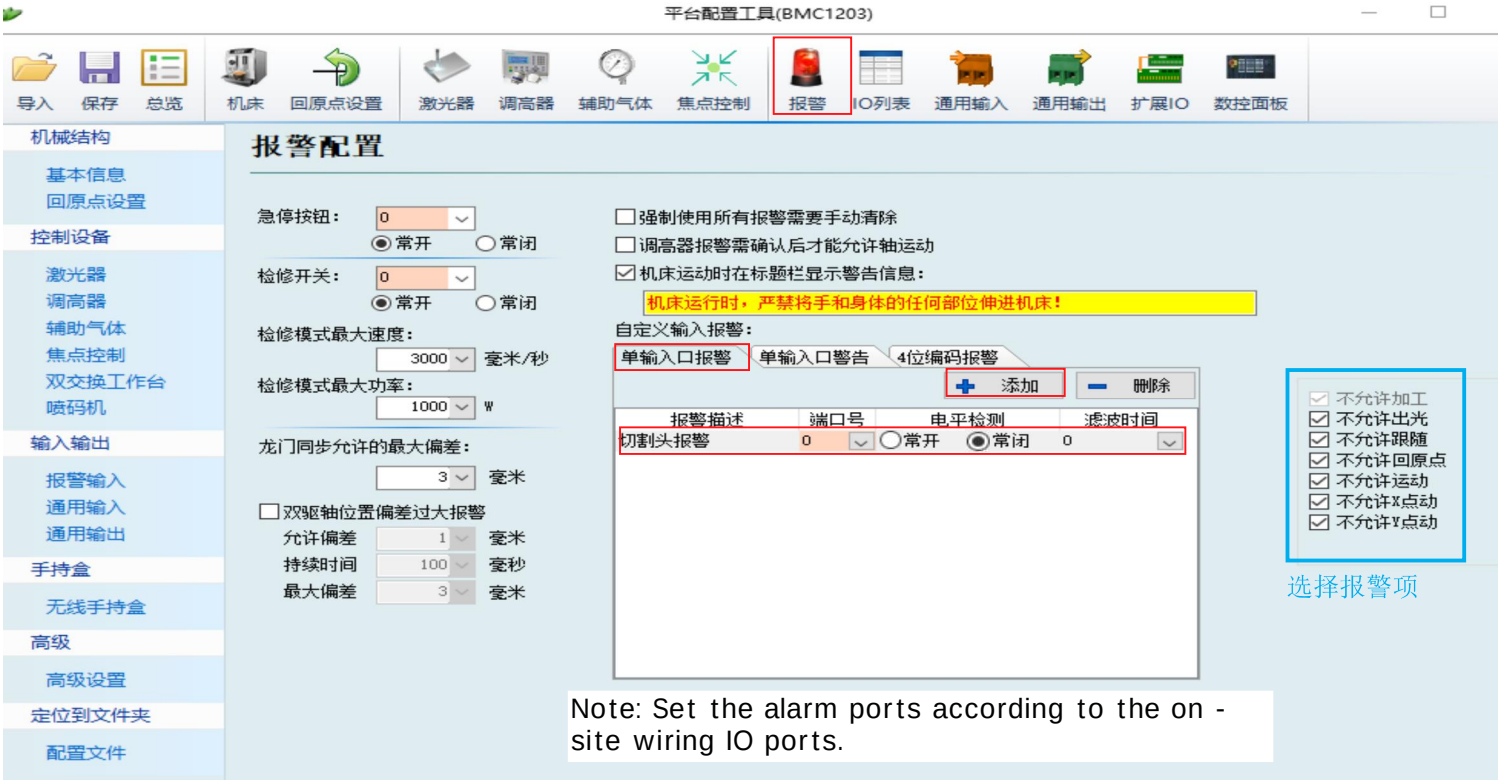
6. System Parameter Configuration Instructions

6.1 Parameter Configuration of BOCHU Pulse System



Note: The focus positions of lasers from different brands may vary. Therefore, the retraction distance should be adjusted according to the actual zero - focus position on site.

Alarm Settings of BOCHU Pulse System



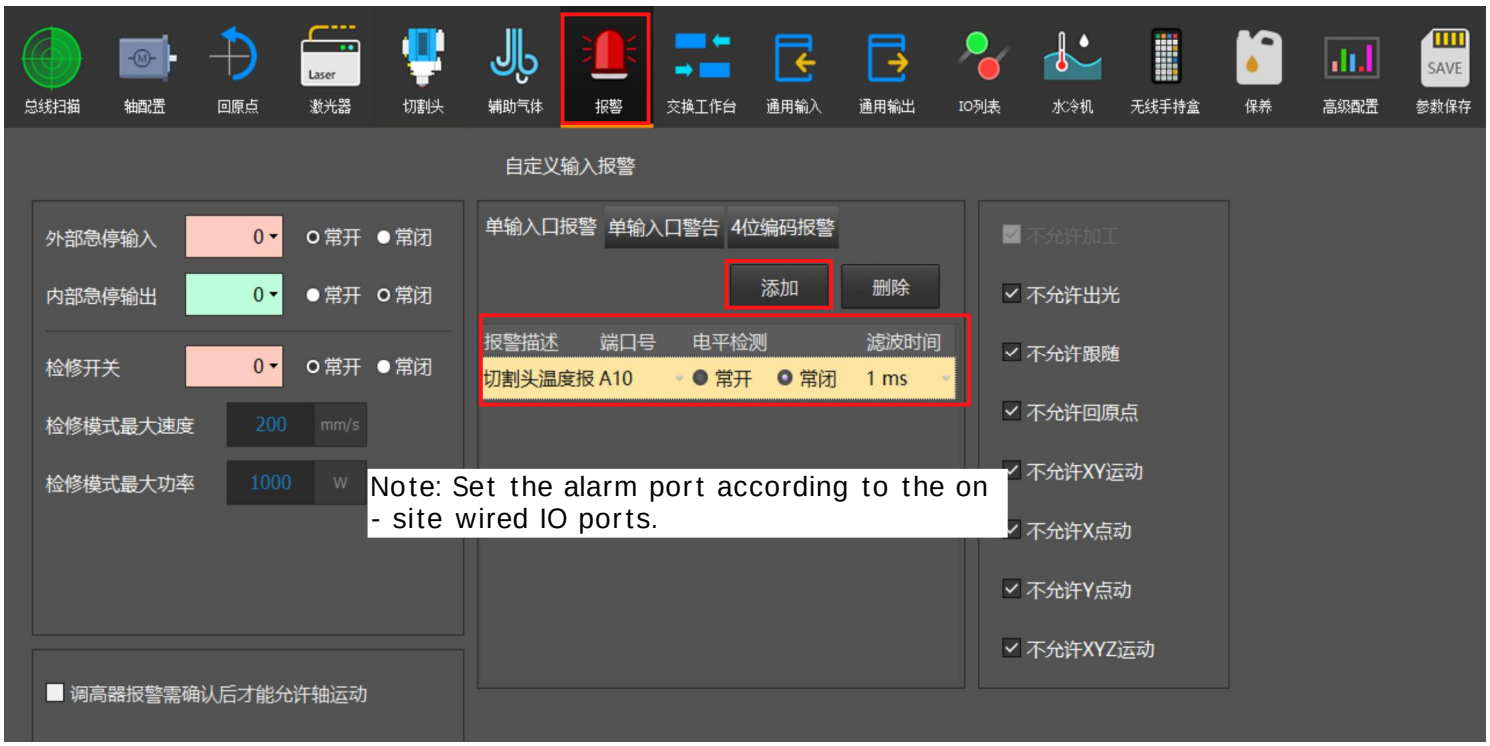
Note: Set the alarm ports according to the on - site wiring IO ports.

Operation Process: Click “ Alarm ” > “ Single Input Port Alarm ” > “ Add ” > Enter the alarm description > Select the corresponding port > Select high or low level > Save

6.2 Parameter Configurationg of BOCHU Bus System

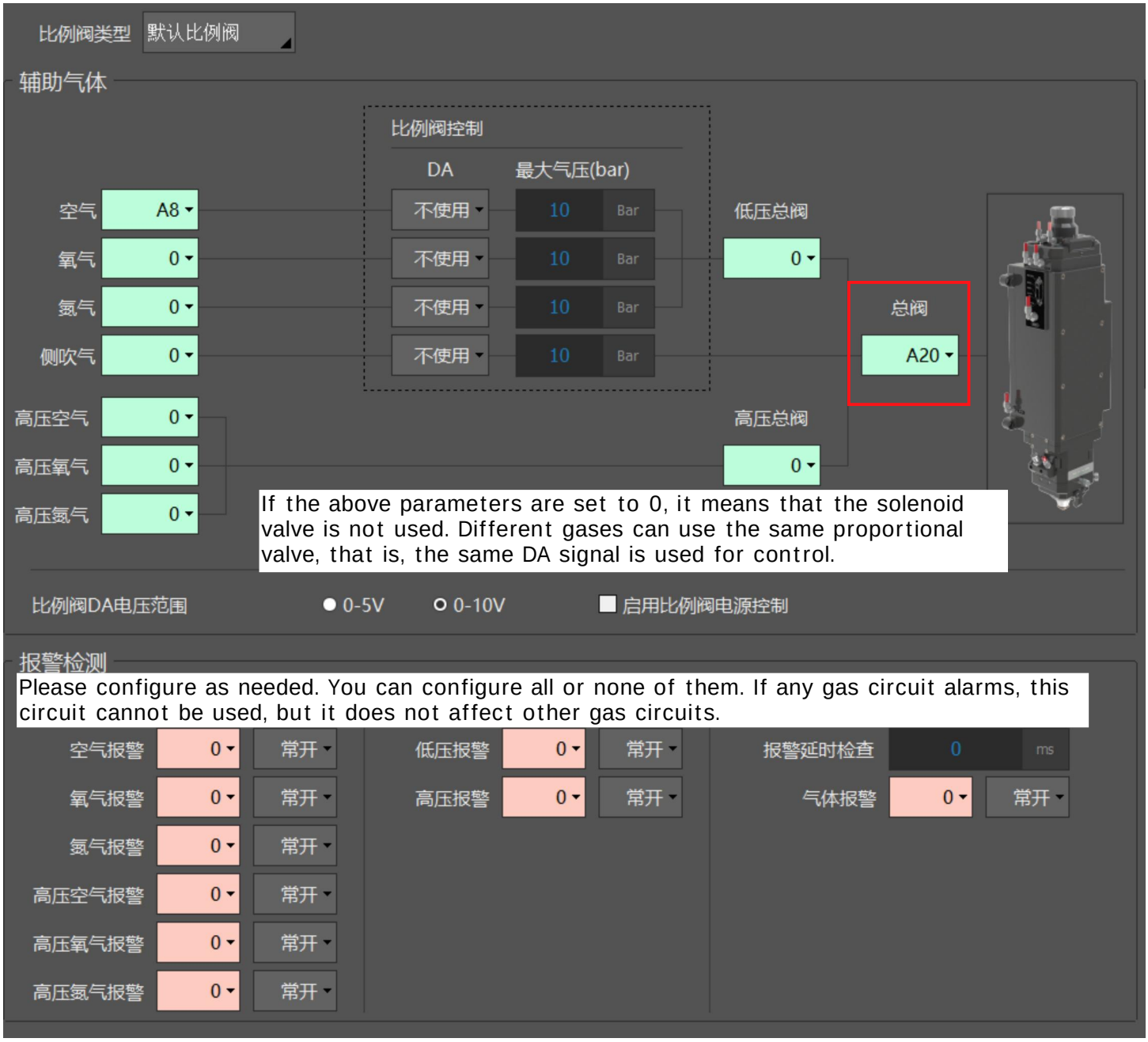
Note: The focus positions of lasers from different brands may vary. Therefore, the retraction distance should be adjusted according to the actual zero - focus position on site.

Alarm Settings of BOCHU Bus System



Operation Process: Click “ Alarm ” > “ Single Input Port Alarm ” > “ Add ” > Enter the alarm description > Select the corresponding port > Select high or low level > Save

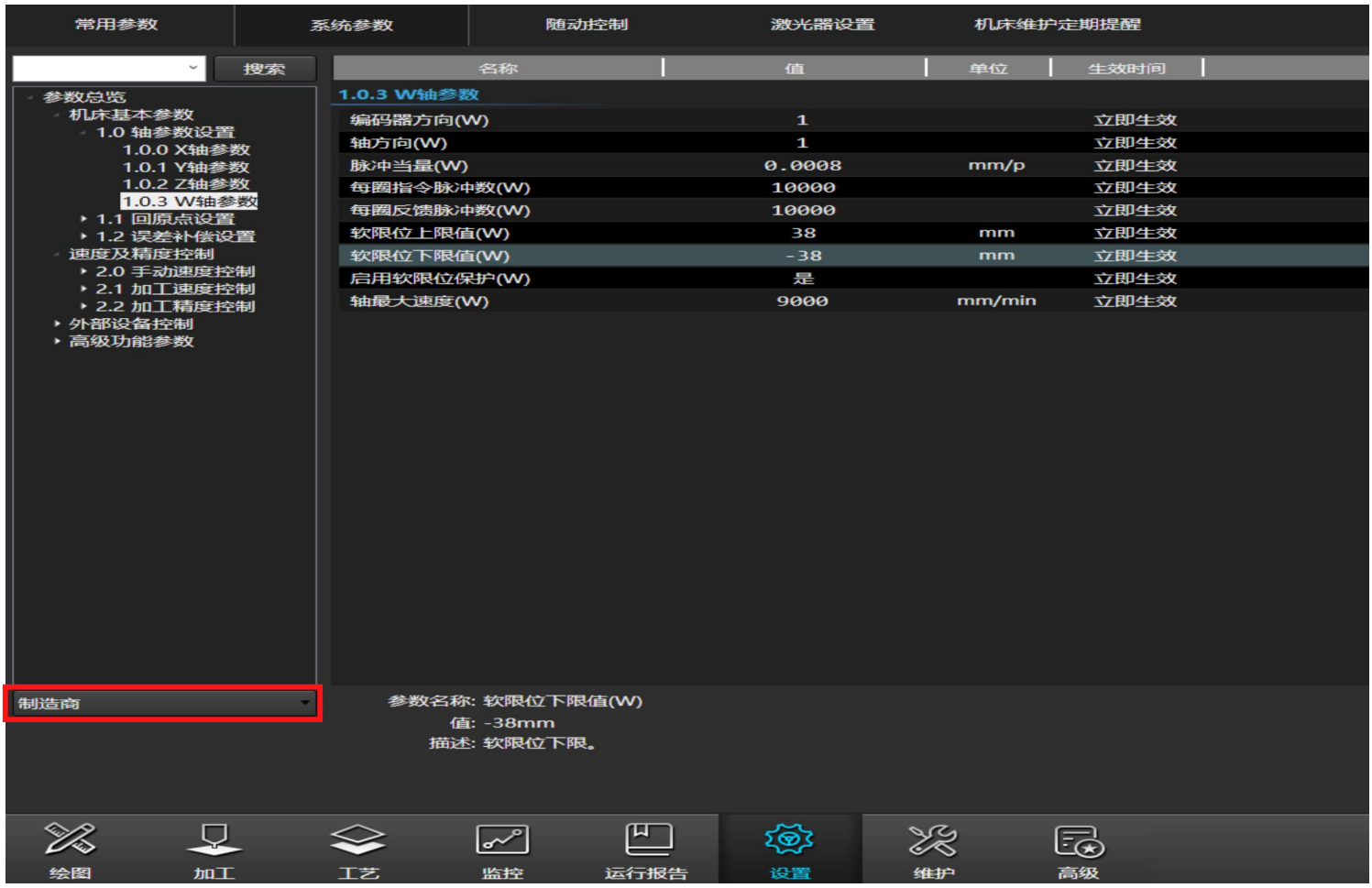
6.3 Parameter Configuration of Bercel System6.3 Parameter Conguration of Bochu System



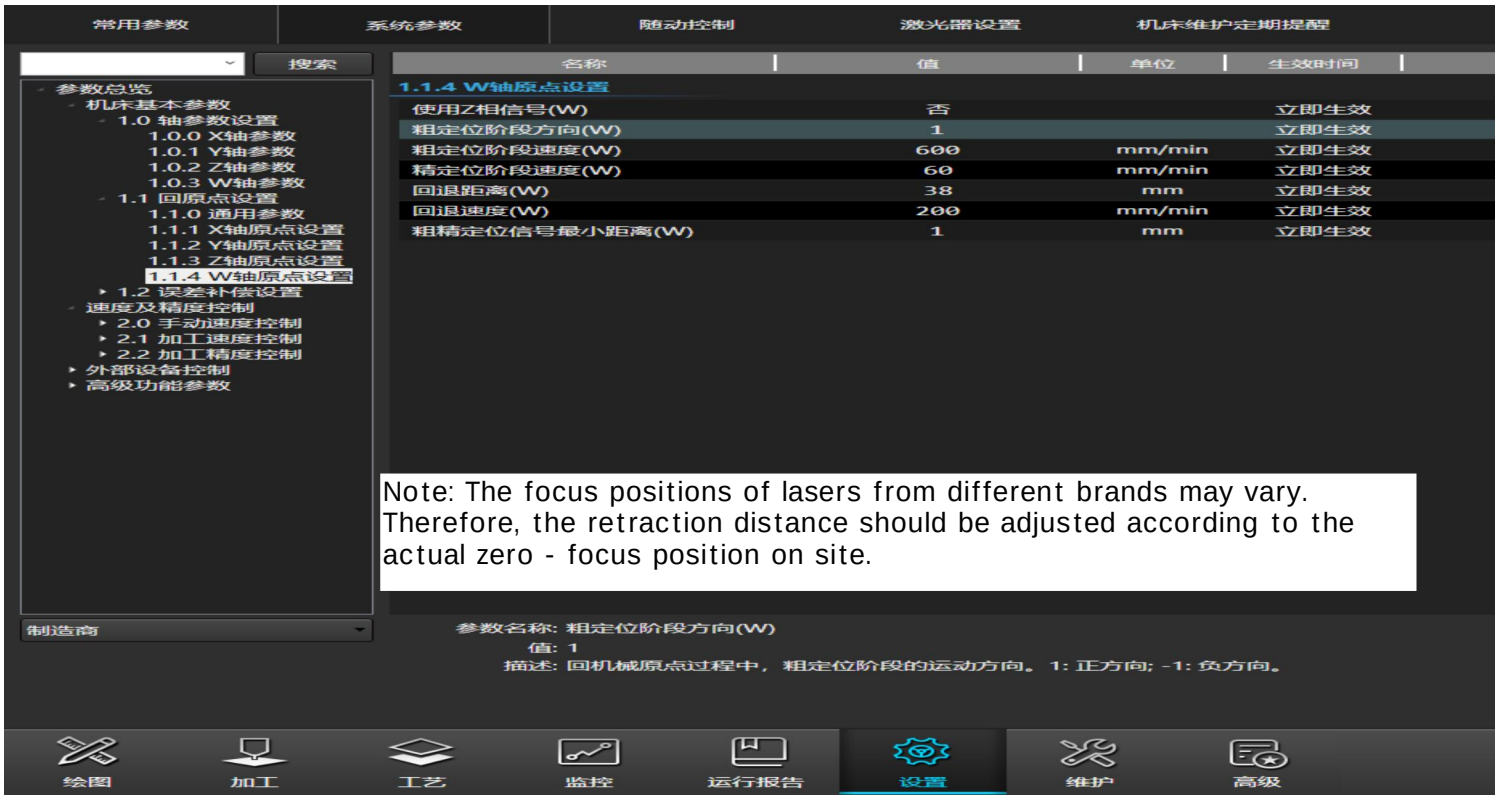
Note:

1. Set the port of the air pressure main valve, which is used for air pressure detection.
2. The setting operation processes of the Bercel pulse system and the bus system are the same.

6.4 Parameter Configuration of Weihong Pulse System



Operation Process: Click “ Manufacturer ” > Password: NcStudio > Enter to modify the parameters of the W - axis.



Operation Process: Modify the origin parameters of the W - axis.

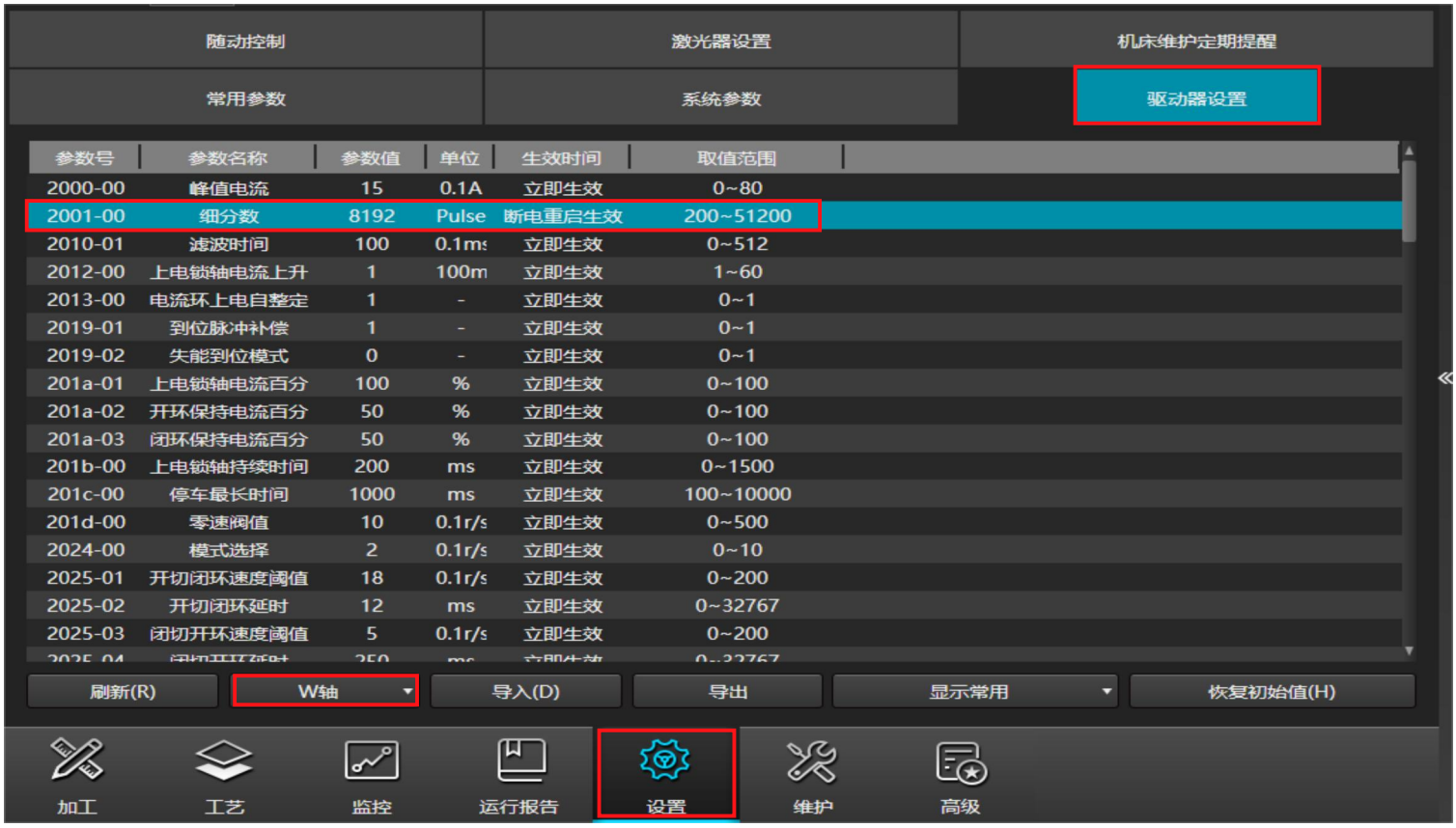
6.5 Parameter Configuration of Weihong Bus System

Operation process: Settings > System parameters > 1.0 Axis parameter settings > 1.03 W Axis parameters

Operation Process: Settings > System Parameters > 1.1 Return - to - Origin Settings > 1.14 W - axis Origin Settings

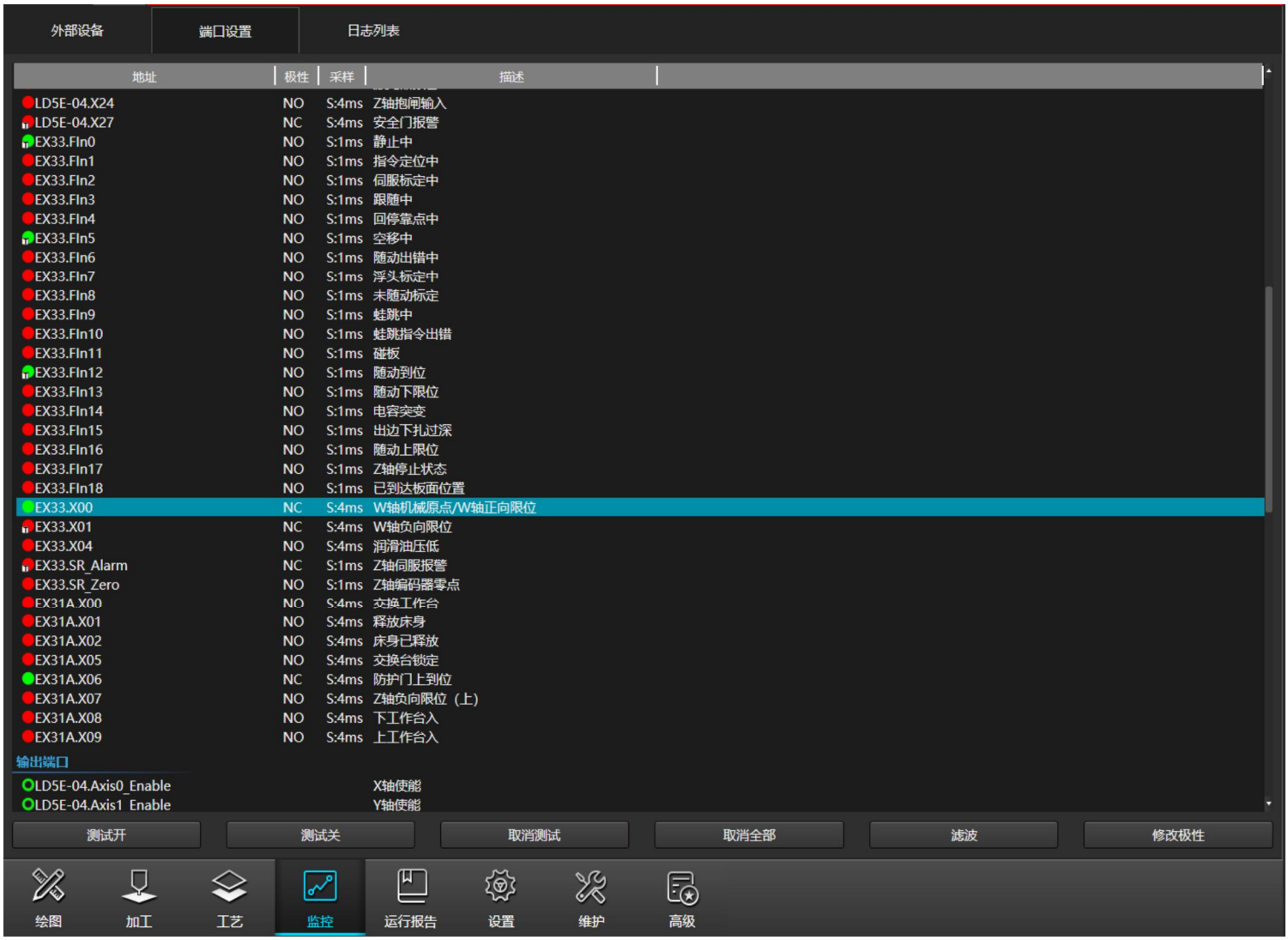
6.6 Focus control options for the Weihong bus system

Operation Process: Settings > System Parameters > 3.5 Focus Control > Modify according to the red frame.



Operation Process: Settings > Driver Settings > Select the W - axis > Sub - division Number > Change to: 8192 > Save > Power off the driver.

6.7 Polarity Modification of Weihong System (Applicable to both bus and pulse systems)



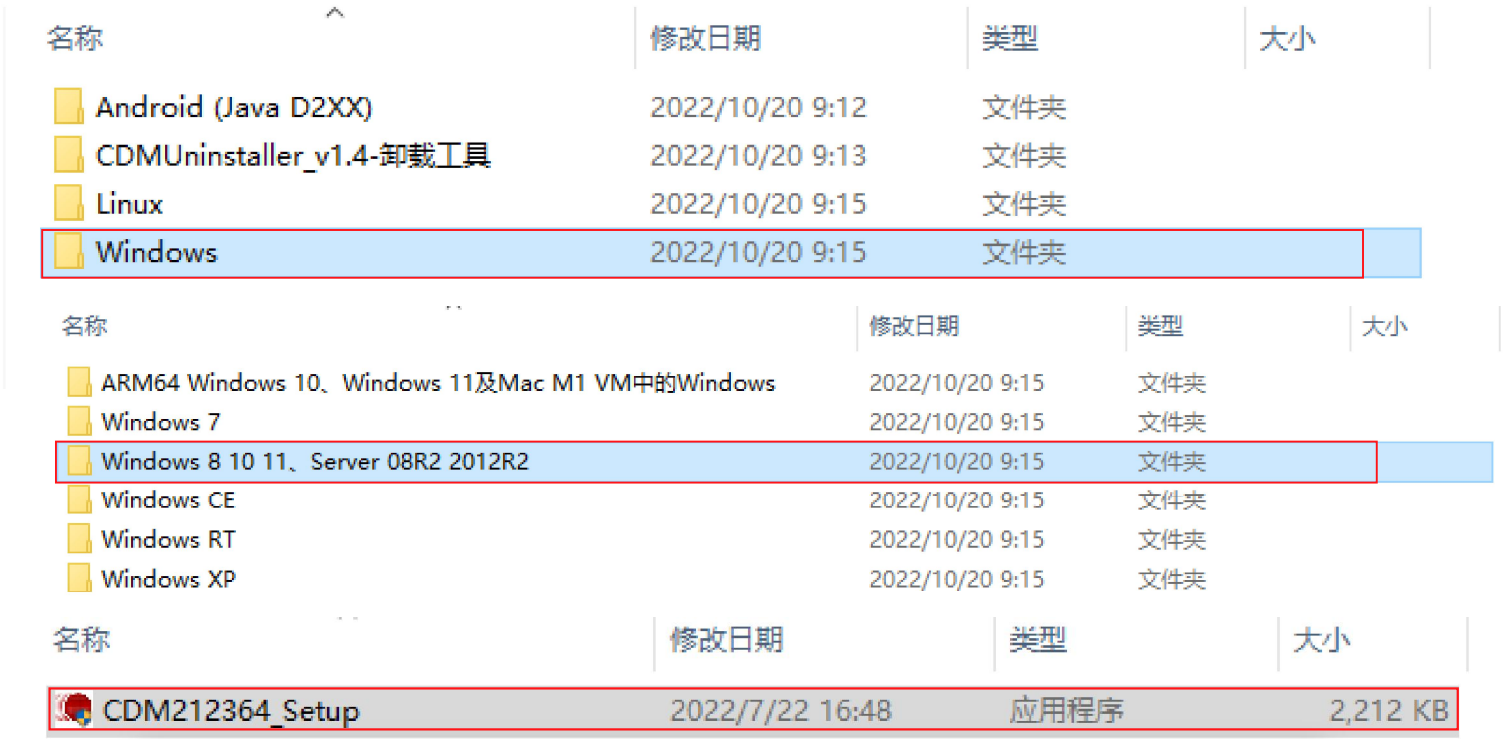
Operation Process: Click “ Monitoring ” > “ Port Settings ” > Check if the polarities are consistent. If not, modify the polarities.

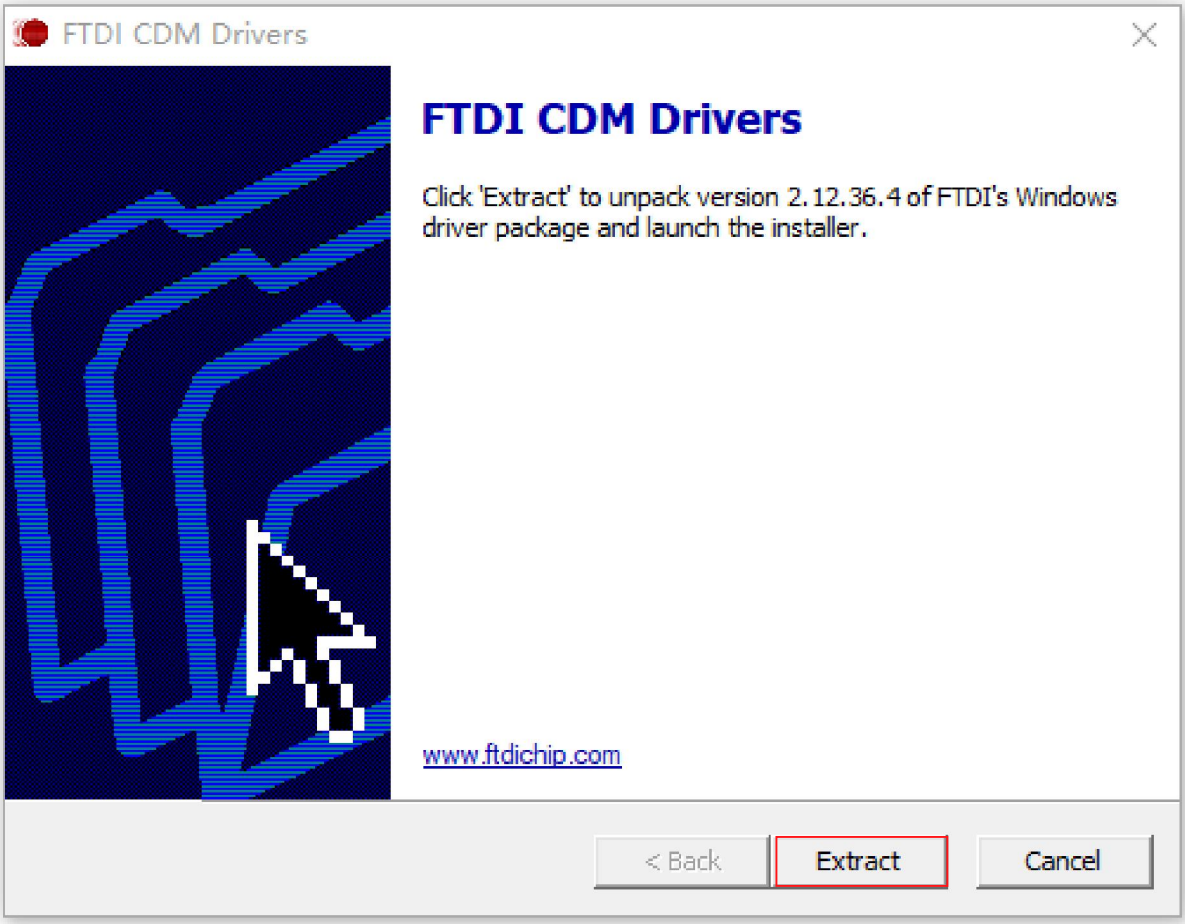
7. USB485 Driver Installation Process

7.1 Installation Process 1

Operation Process: Click “Computer Properties” > “System Type” > “Version” > Install the serial port driver. Select the file corresponding to your computer for installation.

7.2 Installation Process 2





Operation Process: Open the driver file of the serial port cable with FT231XS chip > Windows > Windows 8/10/11 > CDM212364_Setup > Extract

Operation Process: Click “ Next ” > “ I accept this agreement ” > “ Next ”

7.2 Installation Process 4

Operation Process: Click “ Finish ”

Note:
1. Click “ Computer Properties ” > “ Device Manager ” > Check if there is an exclamation mark next to the port . No exclamation mark means the installation is successful.
2. The driver installation package can be downloaded from the official website of UGREEN.

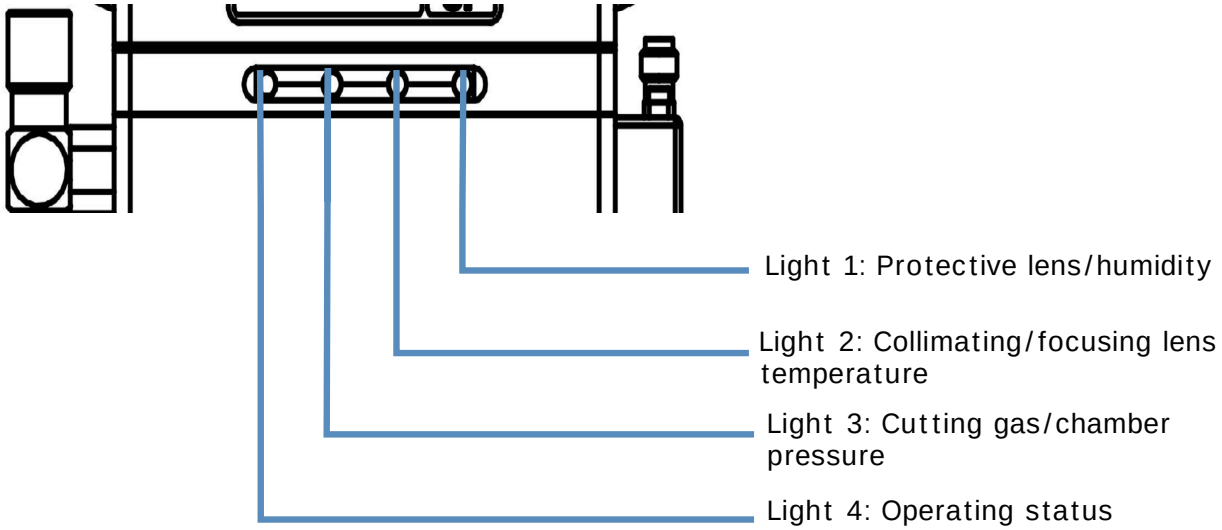
8. Instructions for Using the Monitoring Software

8.1 Installation Process of the Monitoring Software

System.Windows.Interactivity.dll	2024/3/27 9:39	应用程序扩展	55 KB
WSX.Language.dll	2024/8/10 14:34	应用程序扩展	67 KB
WSXMonitor	2024/8/10 14:33	应用程序	607 KB
WSXMonitor.exe.config	2024/8/17 8:43	CONFIG 文件	2 KB

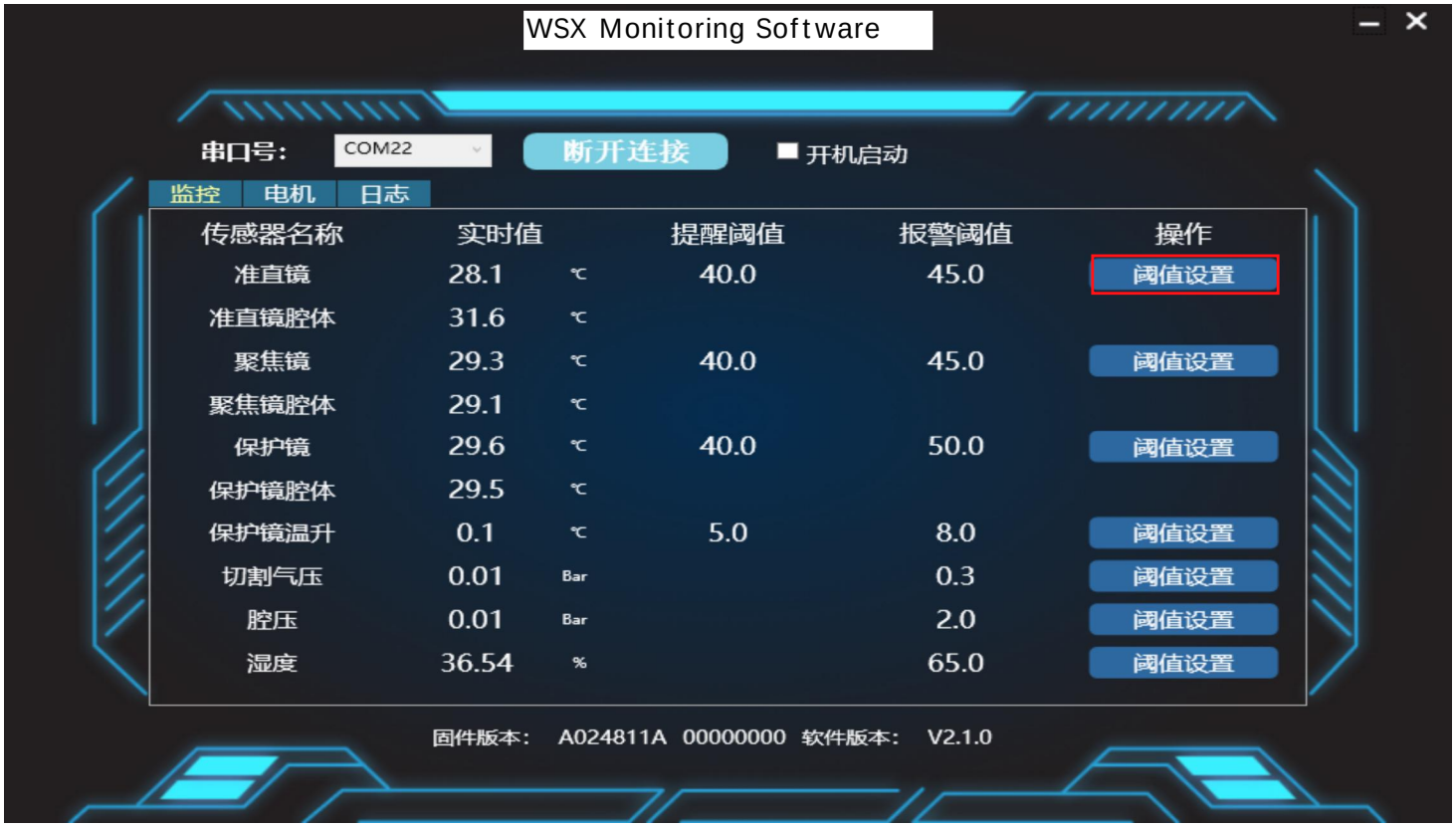
Operation Process: Open the monitoring file > WSXMonitor > Enter the monitoring interface.

8.2 Explanation of the Status Indicator Lights of the Cutting Head



Operation Process: Select the corresponding serial port number > Start monitoring > If the connection is successful, the temperature will be displayed on the interface.

8.3 Monitoring Parameter Settings



Operation Process: Threshold Settings > Enter the password (666666) > Confirm

8.4 Monitoring Parameter Settings

Operation Process: Modify the temperature parameters > Settings.

Note: The default early - warning value and alarm value do not need to be modified.

Operation Process: Log

9. Drive fault code query

9.1 Pulse-type drive alarm codes

Number of times the ALM flashes	Name	Solutions
1	Over current protection	1. Check the connection between the motor winding and the driver, restart the driver. If there is no alarm, check whether there are any abnormalities in the motor and the motor power cable. 2. Disconnect the motor winding cable from the driver and restart the driver. If the driver still alarms, the driver is damaged.
2	Over voltage protection	1. Restart the driver. 2. If the alarm still exists after restarting the driver, check whether the power supply voltage is too high.
3	Op-amp error	1. Restart the driver. 2. If the alarm still exists after restarting the driver, it is a hardware fault of the driver.
4	Axis locking error	Check whether the motor power cable is broken.
5	Storage error	Connect the host computer using the RS232 debugging port and restore the driver to the factory settings. If the alarm still exists after restoring the factory settings, it is a hardware fault of the driver.
6	Motor parameter self-tuning error	1. Restart the driver. 2. If the alarm still exists after restarting the driver, switch the DIP switch SW6 to the on state.
7	Excessive tracking error	1. Check whether the “Motor resolution” in the parameter list is set correctly. 2. Check the wiring between the motor and the driver to see if the phase sequence is wrong. (The motor A+/A-, B+/B- must correspond to the driver’s A+/A-, B+/B-). 3. Check whether the encoder cable is broken. 4. Appropriately increase the acceleration time. 5. Check whether the motor is stuck.
Wrong motor rotation direction	Wrong motor direction setting	Wrong setting of the DIP switch SW5 state.
Motor does not rotate	No pulse signal	Check whether the connection of the pulse signal cable is correct.
Motor rotates in only one direction	Wrong pulse mode selection	Check whether the SW7 pulse mode is set correctly.
	No direction signal	Check whether the connection of the direction signal cable is correct.

Green light does not light up	Not powered on	Check whether the power supply of the driver is correctly connected.

9.2 Bus-type driven alarm codes

Number of times the ALM flashes	Name	Solutions
1	Overcurrent protection	1. Ensure that the driver output cable is not short-circuited; ensure that the motor is not damaged. 2. Adjust the wiring sequence of the motor. 3. Replace the driver with a new one.
2	Overvoltage protection	1. Reduce the power supply voltage on the VDC/GND terminals. 2. Reduce the acceleration and deceleration.
3	Excessive incremental command puls	Check whether the parameter subdivision is correct.
4	Axis locking error	1. Ensure that the wiring of the motor output terminals A+, A-, B+, B- is correct. 2. Ensure that the motor cable is not broken. 3. Ensure that the encoder power supply voltage is normal; ensure that the encoder cable is intact and the encoder ground is in good contact.
6	Self-tuning error	Check whether the motor screw structure is stuck.
7	Position out of tolerance	1. Restart the driver. 2. If the alarm still exists after restarting the driver, check whether the motor power cable is short-circuited. 3. Pull out the motor power cable and restart the driver. If the alarm still exists, the driver is damaged.
8	Encoder disconnection detection	1. Ensure that the encoder cable is correctly connected, and there is no false soldering, misalignment, or short-circuit at the joints.
10	Emergency stop alarm	Ensure that the input signal wiring is correct.
11	Positive and negative limit alarm	Check whether the positive and negative limit signal outputs of the input terminal are normal and whether the hardware is damaged.

12	Command overspeed fault	Check whether the fault occurs after the homing is completed; check whether the slave homing mode is used.
13	Stalling alarm	Check whether the motor screw structure is stuck.
14	Zero-pulling error alarm	1. The encoder resolution of the motor is incorrect, resulting in the motor not being able to run. 2. The motor power cable is connected incorrectly. 3. The motor output is insufficient. Appropriately increase the driver current. 4. If increasing the current still does not work, check whether there is a blockage in the mechanical structure and whether the motor is undersized.
15	Current overload alarm	1. Increase the driver output peak current value Pr4.22 or set bit6 of 0x2056 to 0 to shield it.
Always on	Hardware interrupt protection	Confirm the network connection and the master station ESM conversion sequence.

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